PIONEER®

Service Manual

REPAIR & ADJUSTMENTS

ORDER NO.
ART-701-0

STEREO TURNTABLE

PL-7
PL-720

MODEL PL-7 COMES IN SEVEN VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KUT	120V only	U.S.A. model (Without cartridge)
KCT	120V only	Canada model (Without cartridge)
WE	220V – 240V	Europe model
WB	220V – 240V	United Kingdom model
WP	220V – 240V	Oceania model
R	110V–120V/220V–240V (Switchable)	General export model
R/G	110V-120V/220V–240V (Switchable)	U.S. military model

MODEL PL-720(which is minor change in design from PL-7) COME IN FIVE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
WE	220V – 240V	Europe model
WB	220V – 240V	United kingdom model
WPF	220V – 240V	Oceania model (Without dust cover)
RF	110V–120V/220V–240V (Switchable)	General export model (Without dust cover)
RF/G	110V–120V/220V–240V (Switchable)	U.S. military model (Without dust cover)

- **This is the service manual for model PL-7/KUT. For servicing of the other types, please refer to the additional service manual.**
- Ce manuel d'instruction se refère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
U.S. PIONEER ELECTRONICS CORPORATION 85 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Luithagen-Haven 9, 2030 Antwerp, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

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■ **For the circuit and mechanism descriptions, please refer to the supplement of model PL-7 service manual (ART-768).**

CONTENTS

1. SPECIFICATIONS 2
2. FRONT PANEL FACILITIES 3
3. DISASSEMBLY 4
4. TROUBLESHOOTING 7
5. PRECAUTIONS FOR REASSEMBLY 15
6. ELECTRICAL PARTS LIST 18
7. BLOCK DIAGRAM 20
8. P. C. BOARDS CONNECTION DIAGRAM 21
9. SCHEMATIC DIAGRAM 23
10. EXPLODED VIEWS 25
11. ADJUSTMENTS 30
RÉGLAGE 32
AJUSTE 34

1. SPECIFICATIONS

Motor and Turntable

Drive System . . . . . Direct-drive
Motor . . . . . Quartz PLL Hall motor
Turntable Platter . . . . . 310mm diam. aluminum alloy die-cast
Speeds . . . . . 33-1/3 and 45rpm
Wow and Flutter . . . . . Less than 0.025% (WRMS)
Signal-to-Noise Ratio . . . . . More than 78dB (DIN-B)
(with Pioneer cartridge model PC-3MC)

Tonearm

Type . . . . . Static-balance type, Straight pipe arm
Effective Arm Length 221mm
Overhang 15.5mm
Usable Cartridge Weight . . . . . 3g (min.) to 8g (max.)

Subfunctions

Full auto mechanism, Anti-skating force control, Stylus pressure direct-readout counterweight, Cueing device, Strobe light, Free stop hinges

Miscellaneous

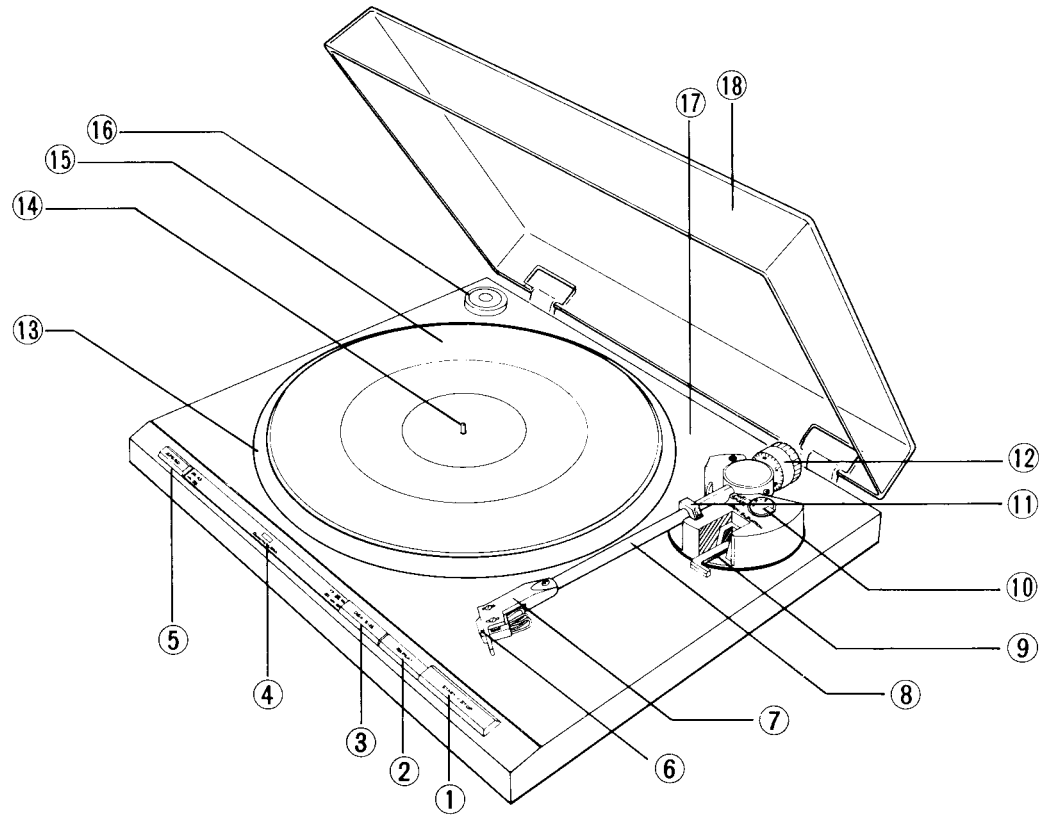
Power Requirements AC120V, 60Hz
Power Consumption 9W
Dimensions . . . . . 420(W) × 108(H) × 367(D)mm
16-1/2(W) × 4-1/4(H) × 14-7/16(D)in.
Weight . . . . . 5.9kg/13 lb

Accessories

EP Adapter 1
Operating Instructions 1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

2. FRONT PANEL FACILITIES



① START/STOP switch
Depress this switch when starting auto play or when stopping play.

② REPEAT switch
Set this switch for repeat play.

③ DISC SIZE switch
Set this switch in accordance with the size of the record which is to be played.
[7" 17] (released position): For 17 cm EPs
[12" 30] (depressed position): For 30 cm LPs

④ Quartz lock indicator
This lights when the platter is rotating at exactly 33-1/3 or 45 revolutions per minute.

⑤ SPEED switch
Set this switch in accordance with the speed of the record which is to be played.
[33] (depressed position): For 33-1/3 rpm records
[45] (released position): For 45 rpm records

⑥ Cartridge

⑦ Headshell

⑧ Tonearm

⑨ ARM ELEVATION lever
Operate this lever when starting manual play or when temporarily suspending play.

⑩ ANTI-SKATE control
This is rotated when performing the anti-skating adjustment.

⑪ Arm rest
This serves to hold and clamp the tonearm. When moving the tonearm, release the clamp.

⑫ Tracking force adjustment weight
This is used when adjusting the tracking force.

⑬ Platter

⑭ Platter mounting shaft

⑮ Rubber mat

⑯ EP adapter
This is used when playing records without a "middle."

⑰ Cabinet

⑱ Dust cover

3. DISASSEMBLY

3.1 PANEL AND BASE

In removing the panel, follow the below listed steps in the order given. Using any unnecessary force will result in bending the springs or damaging other parts.

Panel removal steps

1. Remove the headshell and weight assembly, and the weight shaft assembly.
   The weight shaft assembly is removed by loosening screw (hexagone socket screw) and the headshell by loosening screw ❶.
2. Lift off the turntable platter.
3. Loosen insulator attachment screws ❷ and remove the insulator. (Do not mix the color-coded float springs. They must be replaced with their original insulators during reassembly.)
4. Set the record size selector switch to "30cm".
5. Release the arm clamp and move the tonearm as far as it will go toward the center. Then rotate the motor center shaft clockwise returning the tonearm to the arm rest. Stop the center shaft.
6. Remove the rear panel PU cord strain relief.

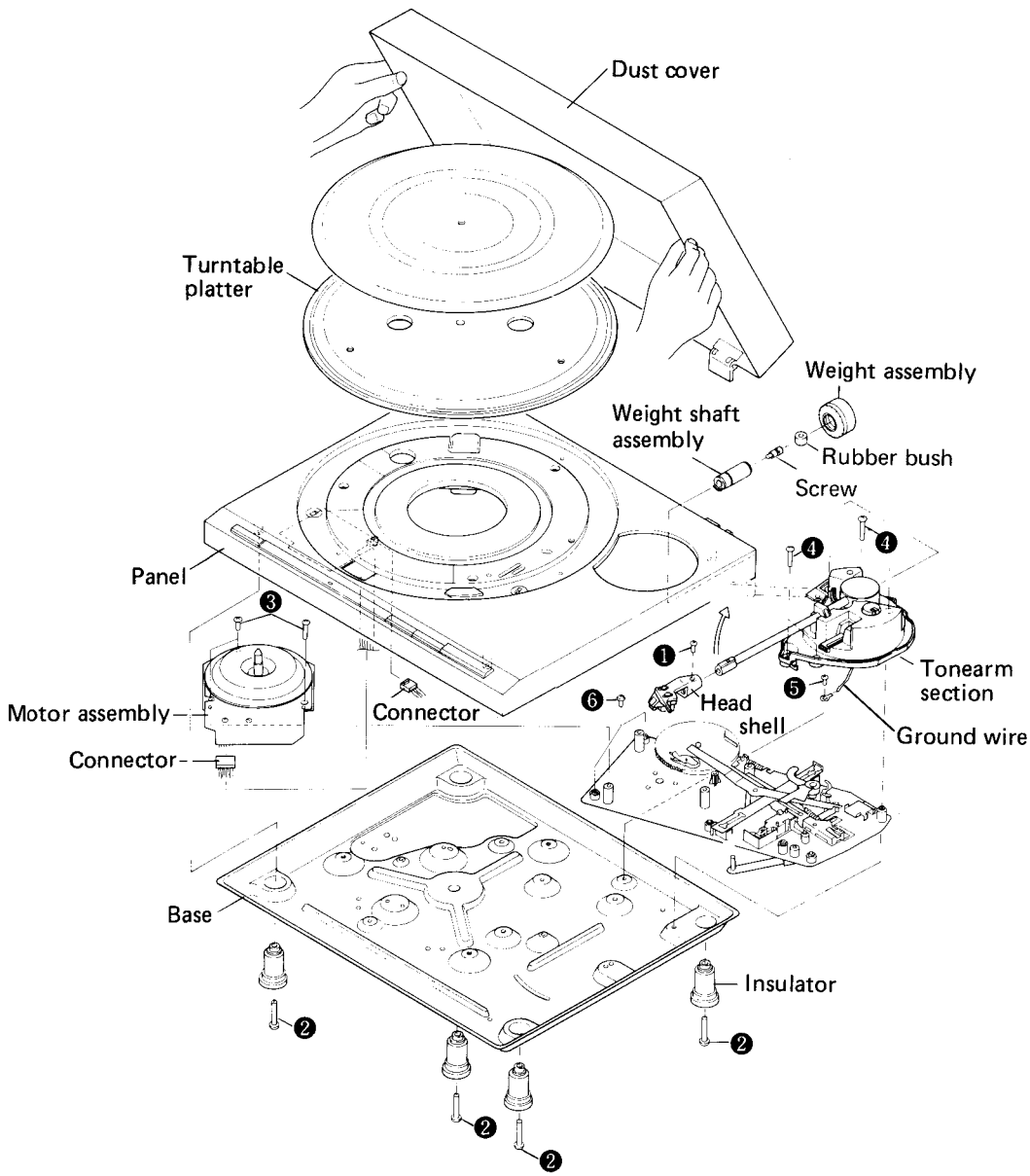


Fig. 3-1 Disassembly

7. Unplug the 2P, 2P and 6P connectors.
8. Completely remove the PU cord from the panel.
9. Lift up the headshell end of the tonearm, and taking care not to damage the tonearm, remove it from the panel. (Hold the tonearm steady.)

3.2 D.D MOTOR ASSEMBLY

After the panel has been removed, loosen the three motor attachment screws ❸ and remove the motor.

3.3 TONEARM SECTION

Remove the tonearm section by taking out the three arm base attachement screws ❹ and one ground wire securing screw ❺.

3.4 CONTROL MECHANISM SECTION

After the tonearm section has been removed, loosen the three control mechanism attachment screws ❻and remove the assembly.

3.5 TONEARM

1. Disconnect the tonearm lead wires from the PU board (See Fig. 3-2).
   Note that some of the lead wires have been soldered to the PU board, and must be disconnected with care.
2. Loosen the set screw ❼ with a screwdriver to remove the PU plate under the arm base (See Fig. 3-3).
3. Undo the screw ❽securing the tonearm to the arm base (See Fig. 3-3).

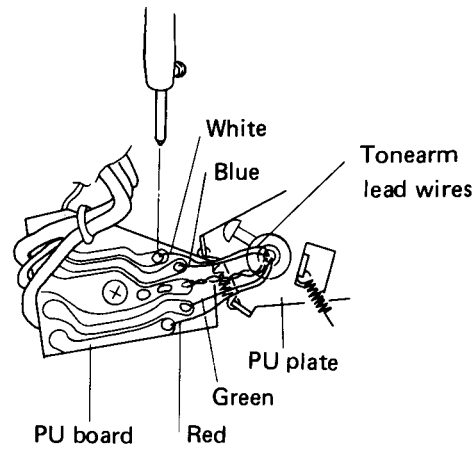


Fig. 3-2 Disconnect the tonearm lead wires

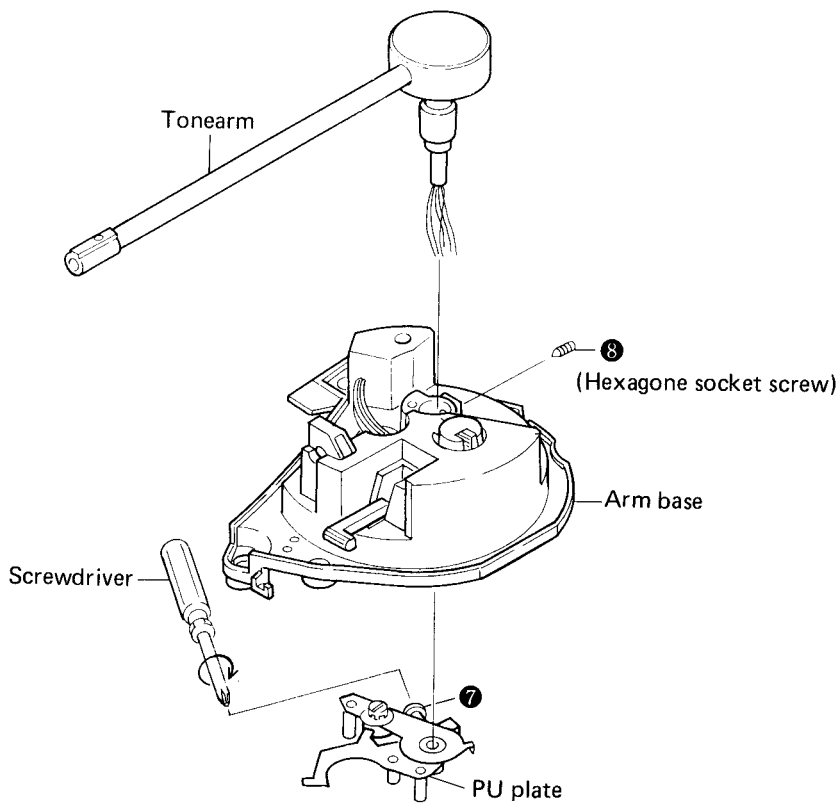


Fig. 3-3 Remove tonearm

3.6 PANEL AND BASE REASSEMBLY

1. Turn the center shaft clockwise so that the mechanism assembly is set to the reset position.
2. Hook the driver lever spring to the panel boss.
3. Lift the forward of the panel and plug in the 2P and 6P connectors.
4. Clamp the tonearm in the arm rest and push the START/STOP buttom.
5. Attach the PU cord stopper.
6. Attach the insulators. (Make certain the color-coded float springs are attached to the correct insulators.)
7. Attach the weight shaft assembly.

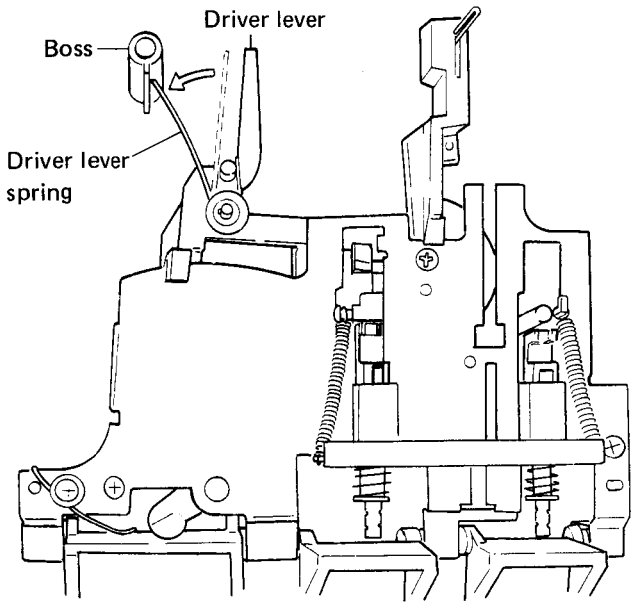


Fig. 3-4 Spring positioning

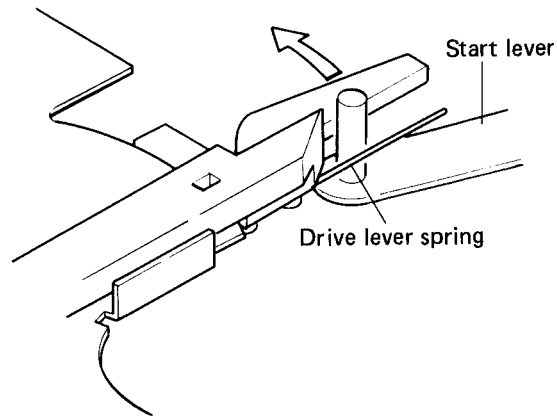
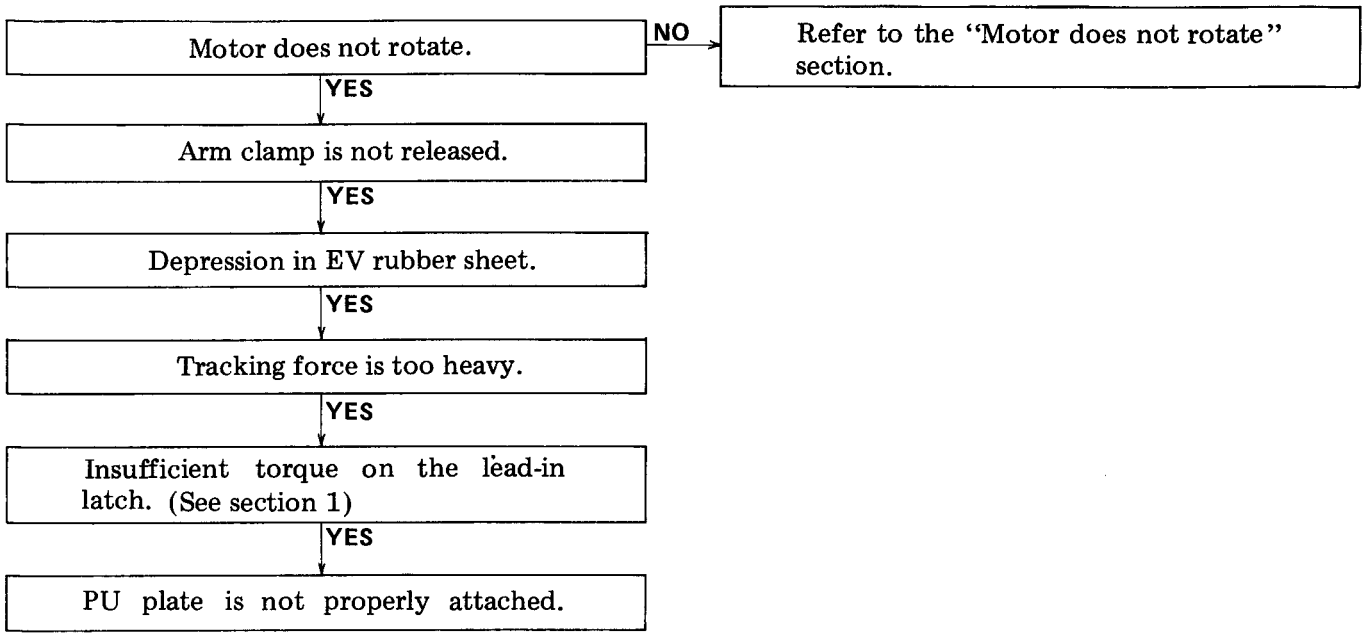


Fig. 3-5 Positioning the spring

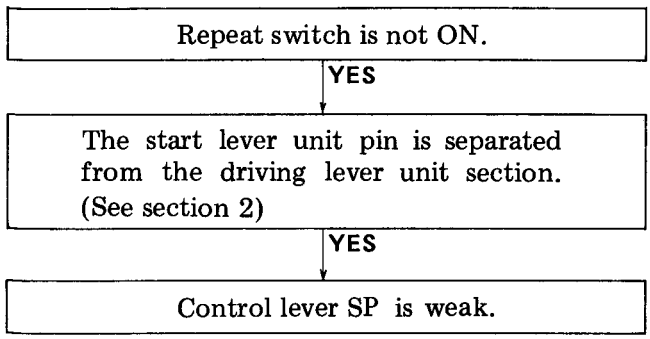
4. TROUBLESHOOTING

Use the following directions to find the cause of each type of breakdown. Improper adjustment units should be completely readjusted.

■ DOES NOT LEAD IN



■ DOES NOT REPEAT


Repeat switch is not ON.
YES
The start lever unit pin is separated from the driving lever unit section. (See section 2)
YES
Control lever SP is weak.

Section 2

As shown in figure 4-2, if the start lever unit pin is out of line in the direction of Ⓐ, repeat will not operate. If it is too far in the direction of Ⓑ, the unit will not start. In these cases, assemble referring to the method of joining the panel and bottom panel (lid).

Section 1

As shown in figure 4-1, if the force required to turn over the lead-in latch is less than 180g at a point 13mm from the center, band the click leaf spring toward until the force is 180 — 320g.

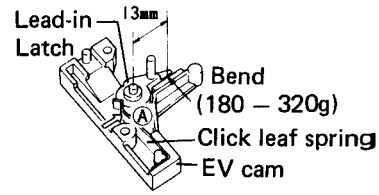


Fig. 4-1 Adjustment of lead-in latch with insufficient torque

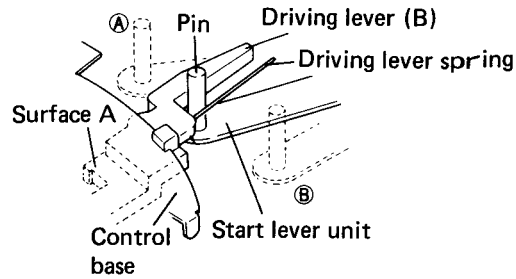


Fig. 4-2 Misaligned pin of start lever unit

■ REPEAT FUNCTION IS REPEATED

Separate the panel section and bottom panel and, as shown in figure 4-3, apply a tension of 10g to the start lever unit pin in direction Ⓐ. If the repeat function operates, the selector and reset plate sections are not moving properly. If the unit stops, the driving lever (B) is not moving properly.

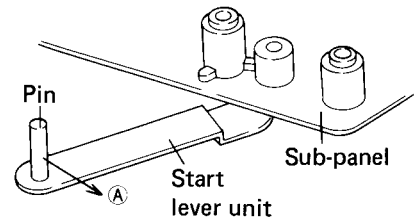
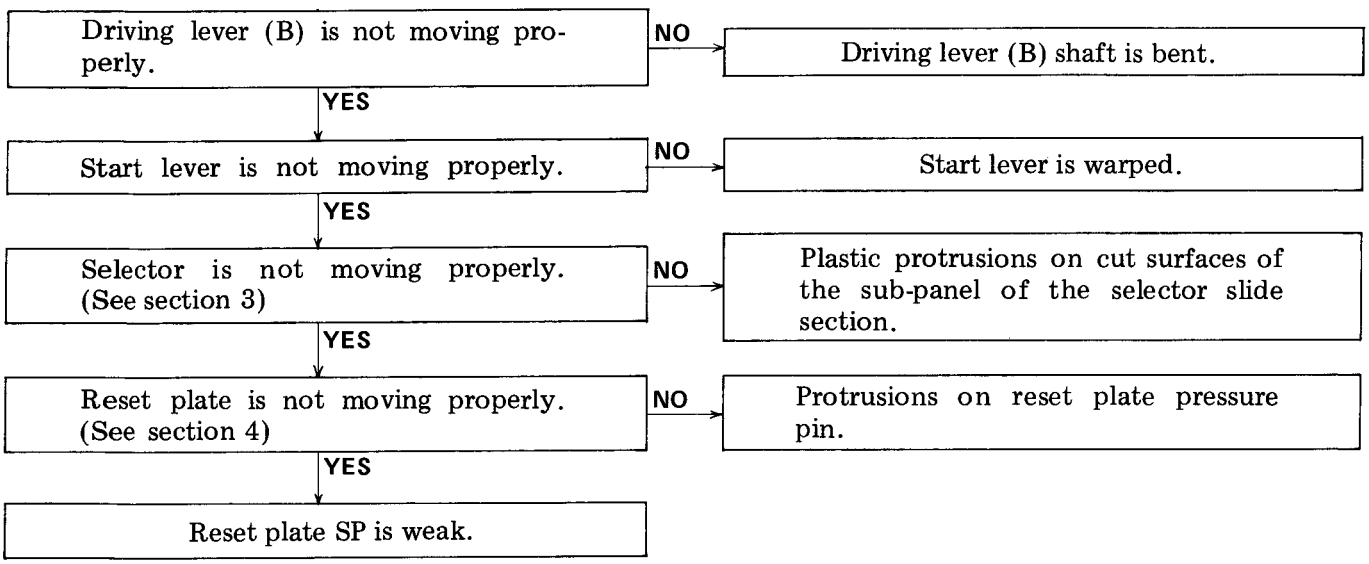


Fig. 4-3 Check of repat operation.


Driving lever (B) is not moving properly.
NO
Driving lever (B) shaft is bent.
YES
Start lever is not moving properly.
NO
Start lever is warped.
YES
Selector is not moving properly. (See section 3)
NO
Plastic protrusions on cut surfaces of the sub-panel of the selector slide section.
YES
Reset plate is not moving properly. (See section 4)
NO
Protrusions on reset plate pressure pin.
YES
Reset plate SP is weak.

Section 3

If there are protrusions remaining from the original-pressing process on surfaces Ⓐ, Ⓑ, and Ⓒ of the sub-panel which slides with the selector, the movement of the selector will be adversely affected. Therefore, these protrusions must be removed (Fig. 4-4).

Section 4

If there are plastic protrusions on the pressure pin section of section Ⓓ of the reset plate, these protrusions will come in contact with the lower surface of the driving panel when the reset plate moves in direction Ⓔ and the movement of the reset plate will be adversely affected. Therefore, these protrusions must be removed (Fig. 4-4).

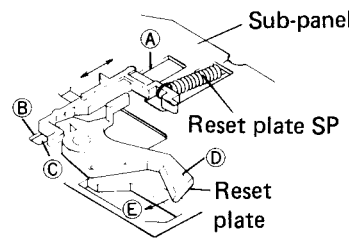


Fig. 4-4 Improper movement of selector

■ AUTO-RETURN DOES NOT WORK

Section 5

After performing the return operation, if the curved section of the signal plate and curved section of the starting plate are not in contact with surfaces Ⓐ and Ⓑ respectively of the cam, reset will be incomplete and the starting position will be late. As a result, the return function may not operate at times. In this case, bend the signal plate Ⓒ so that dimension A is 0.5mm or larger.

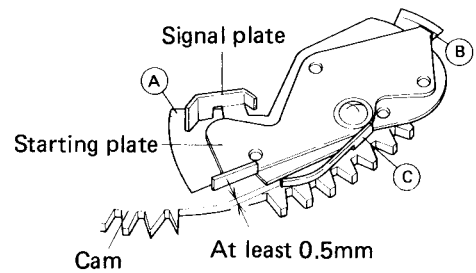


Fig. 4-5 Incomplete reset of starting and signal plates

Change in starting position adjustment.

YES

Starting plate does not follow the signal plate. — NO → Too much grease between the signal plate and the cam.

YES

- Inner diameter of the starting plate hole is small.
- Protrusions on the caulk section of the starting plate hole.
- Not enough grease between the starting plate and signal plate.

After starting, incomplete reset of the signal plate. (See section 5) — NO → The curved section of the signal plate is deformed.

YES

The inner areas of records can not be tracked. — NO →

- Arm lead wire is caught on something.
- PU cord is touching the PU plate.
- Operator of the detection lever is not smooth.

YES

Looseness in the PU plate attachment.

■ **RETURN IS FAST (RETURN AT 1mm PITCH)**

Protrusions on the pinion gear section (See section 6)

Section 6

If there are tough areas of plastic protruding from the Ⓐ section of the protruding section of the pinion gear, the return function may operate at a pitch of only 1mm. In this case, remove the plastic protrusions completely (Fig. 4-6).

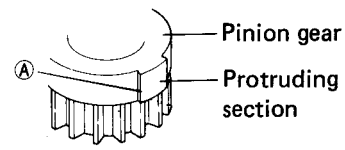
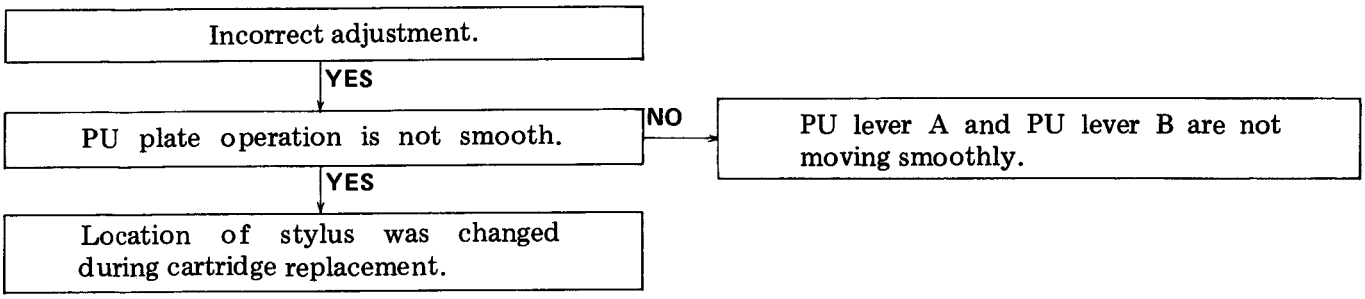


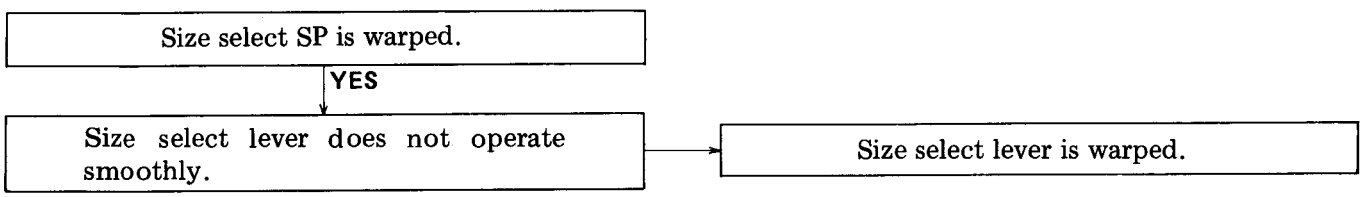
Fig. 4-6 Elimination of pinion gear protrusions

■ TONEARM DOES NOT LOWER IN CORRECT POSITION

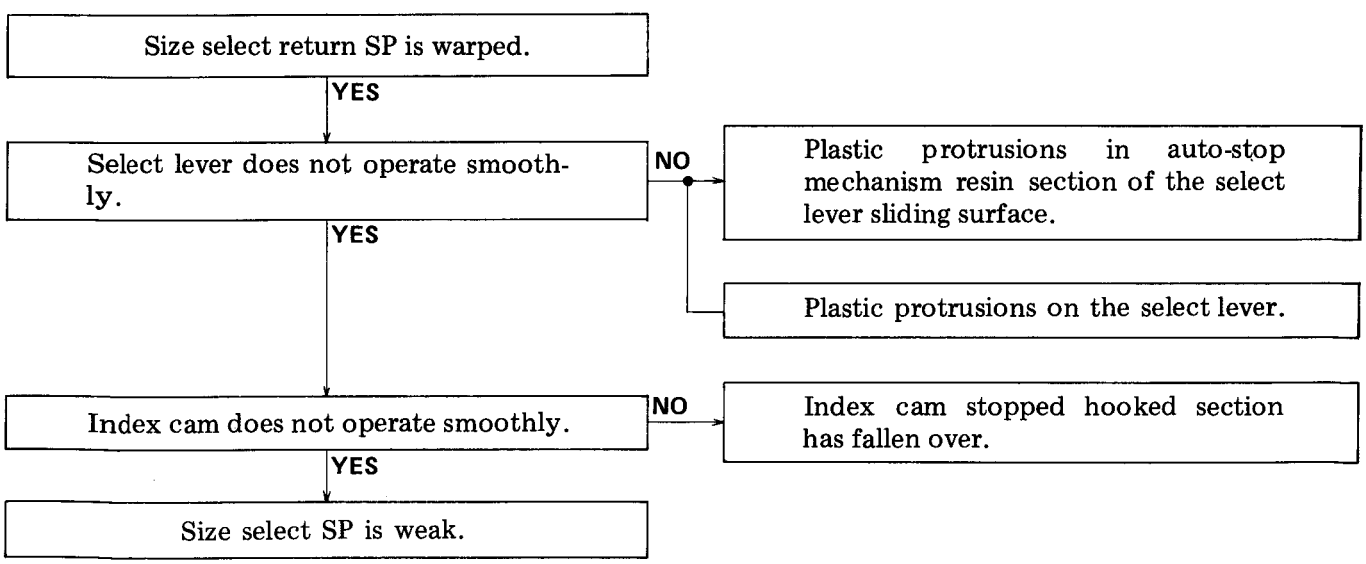

Incorrect adjustment.
YES
PU plate operation is not smooth.
NO
PU lever A and PU lever B are not moving smoothly.
YES
Location of stylus was changed during cartridge replacement.

■ RECORD SIZE SELECTOR DOES NOT WORK

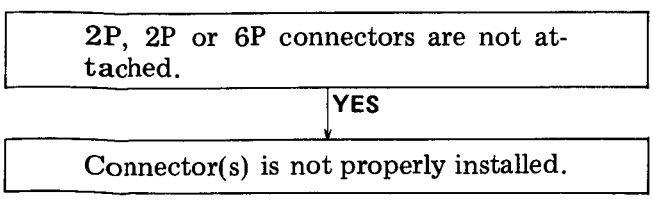
Tonearm descends at 17cm location when record size selector is set at 30cm.



Tonearm descends at 30cm location when record size selector is set at 17cm.


Size select return SP is warped.
YES
Select lever does not operate smoothly.
NO
Plastic protrusions in auto-stop mechanism resin section of the select lever sliding surface.
Plastic protrusions on the select lever.
YES
Index cam does not operate smoothly.
NO
Index cam stopped hooked section has fallen over.
YES
Size select SP is weak.

■ MOTOR DOES NOT ROTATE



■ **WITH THE RECORD SIZE SET AT 17cm, THE TONEARM IS RETURNED TO THE ARM REST.**

Detector lever and signal lever are touching.

↓

Detector lever is bent.

■ **AUTO OPERATION REPEATS**

Detector lever and leaf spring (start plate) are touching at the mechanism stop location. — NO → Leaf spring (start plate) is deformed.

■ **MOTOR DOES NOT STOP**

Start panel is not moving properly. — NO → EV cam is warped.

Start panel is not moving properly. — NO → The start plate spring is weak. (See section 7)

Start panel is not moving properly. — YES ↓

The switch lever and switch locker are not locking (See section 7). — NO → The installation location of the PU plate is incorrect.

Section 7

In order to turn the power OFF, the PU plate shaft touches surface Ⓐ of the switch locker pushing it over so it locks with the switch lever turning the microswitch OFF (Fig. 4-7). If the amount of push on the switch locker is insufficient, it can not lock with the switch lever. With the tonearm locked in the arm rest, as shown in figure 4-8, attach the PU plate precisely midway between the first and second points from the arm base scale mark counting away from you.

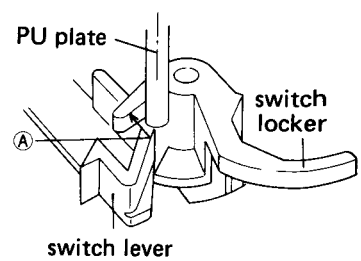


Fig. 4-7 Adjustment of switch locker

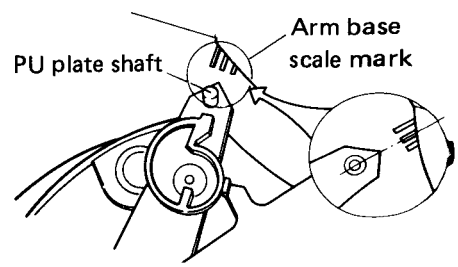


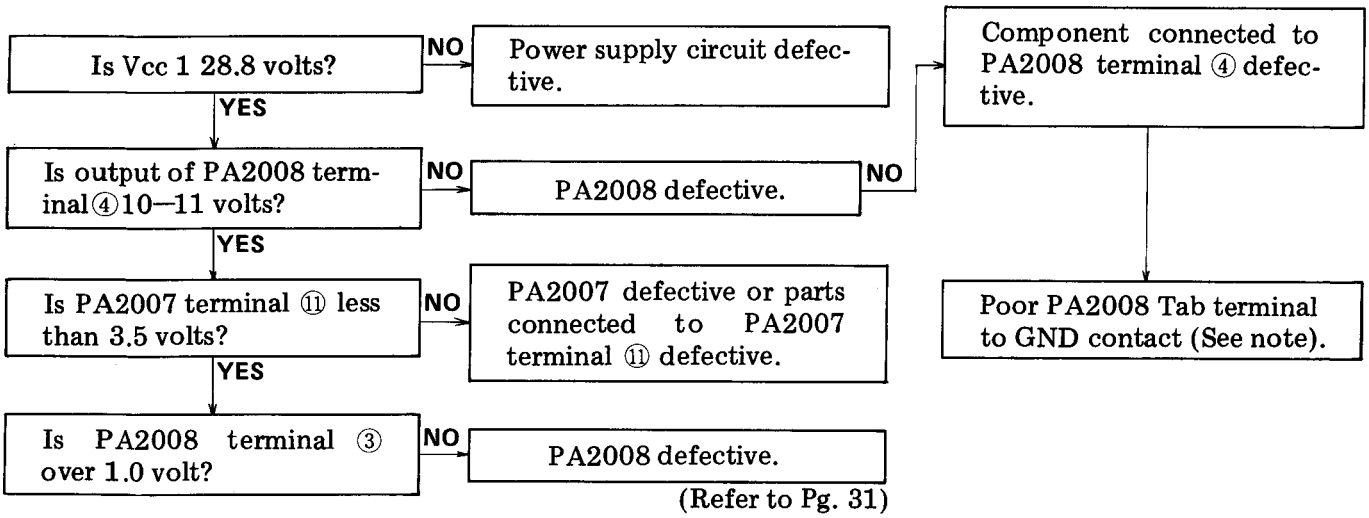
Fig. 4-8 Adjustment of PU plate

■ MOTOR ASSEMBLY

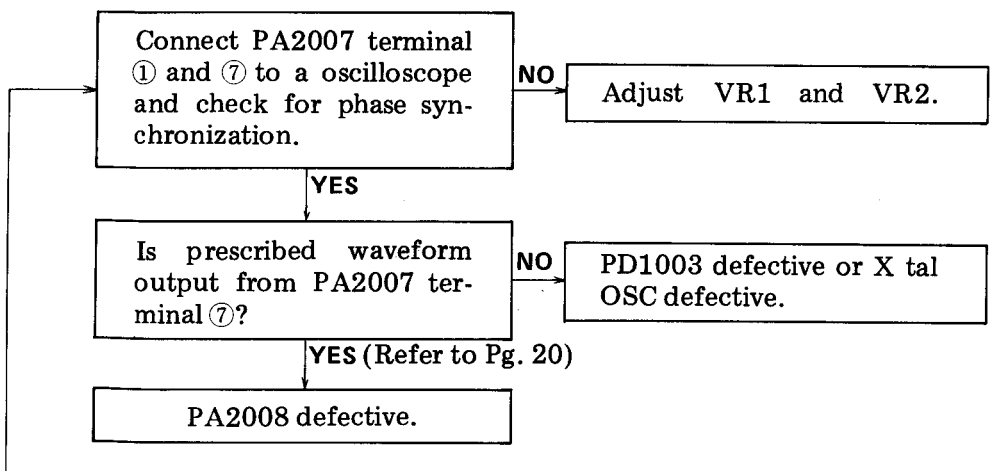
NOTE:

The IC PA2008 used in the PXM-091 does not have a dedicated ground pin for its internal circuitry, but uses the thermal fan ground. When replacing the IC, make sure the securing screws retaining the ground line between the IC and thermal dissipator and between the thermal dissipator and motor base, and base to circuit board is securely tightened.

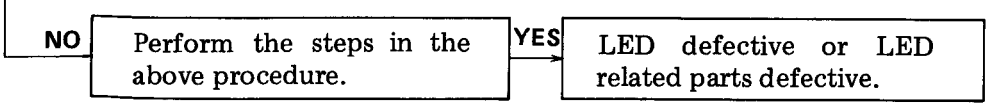
• Motor Does not Turn



• Unsteady Rotation


Connect PA2007 terminal ① and ⑦ to a oscilloscope and check for phase synchronization.
NO
Adjust VR1 and VR2.
YES
Is prescribed waveform output from PA2007 terminal ⑦?
NO
PD1003 defective or X tal OSC defective.
YES (Refer to Pg. 20)
PA2008 defective.

• Lock Indicator Blinking



■ WITH THE RECORD SIZE SET AT 17cm, THE TONEARM IS RETURNED TO THE ARM REST.

Detector lever and signal lever are touching.

↓

Detector lever is bent.

■ AUTO OPERATION REPEATS

Detector lever and leaf spring (start plate) are touching at the mechanism stop location.

NO → Leaf spring (start plate) is deformed.

■ MOTOR DOES NOT STOP

Start panel is not moving properly.

NO → EV cam is warped.

NO → The start plate spring is weak. (See section 7)

YES ↓

The switch lever and switch locker are not locking (See section 7).

NO → The installation location of the PU plate is incorrect.

Section 7

In order to turn the power OFF, the PU plate shaft touches surface Ⓐ of the switch locker pushing it over so it locks with the switch lever turning the microswitch OFF (Fig. 4-7). If the amount of push on the switch locker is insufficient, it can not lock with the switch lever. With the tonearm locked in the arm rest, as shown in figure 4-8, attach the PU plate precisely midway between the first and second points from the arm base scale mark counting away from you.

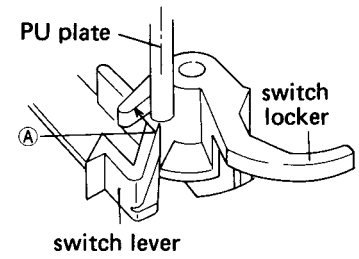


Fig. 4-7 Adjustment of switch locker

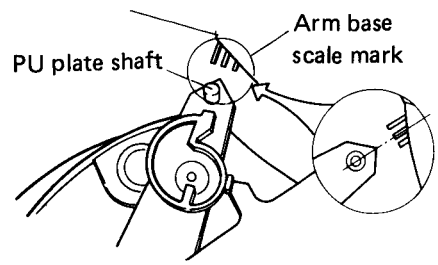


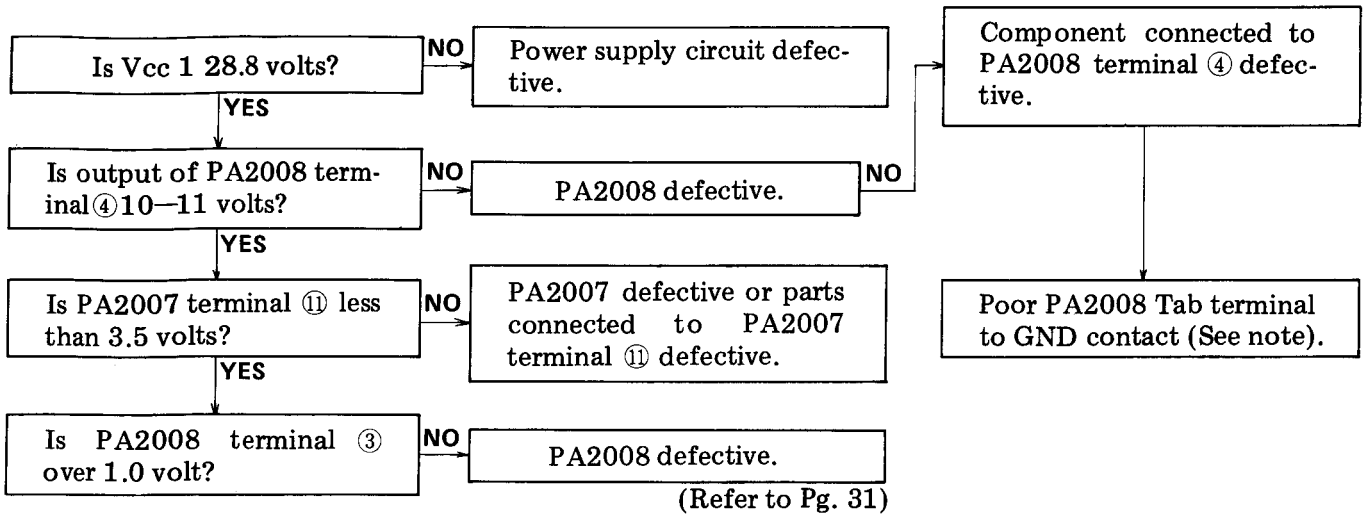
Fig. 4-8 Adjustment of PU plate

■ MOTOR ASSEMBLY

NOTE:

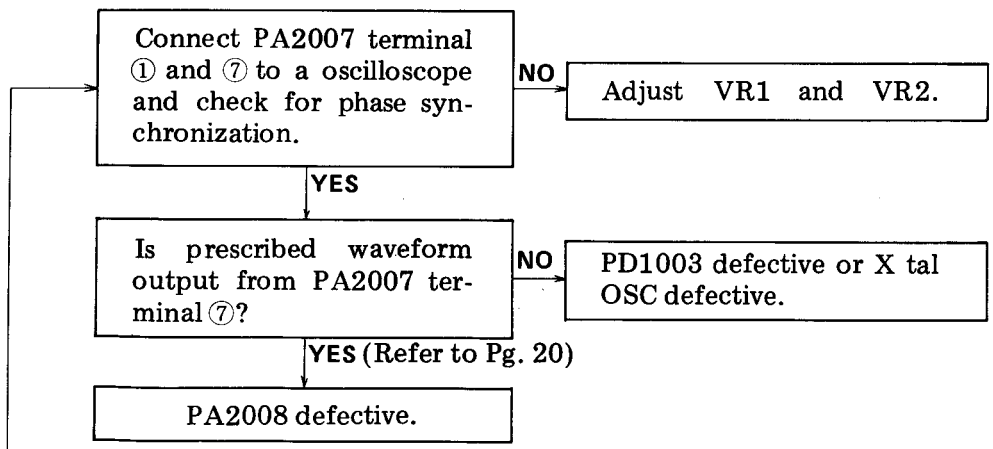
The IC PA2008 used in the PXM-091 does not have a dedicated ground pin for its internal circuitry, but uses the thermal fan ground. When replacing the IC, make sure the securing screws retaining the ground line between the IC and thermal dissipator and between the thermal dissipator and motor base, and base to circuit board is securely tightened.

• Motor Does not Turn

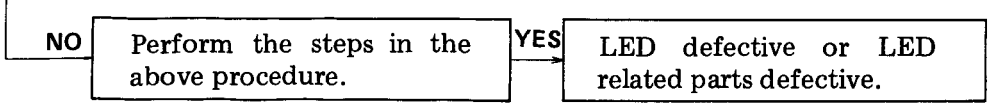


(Refer to Pg. 31)

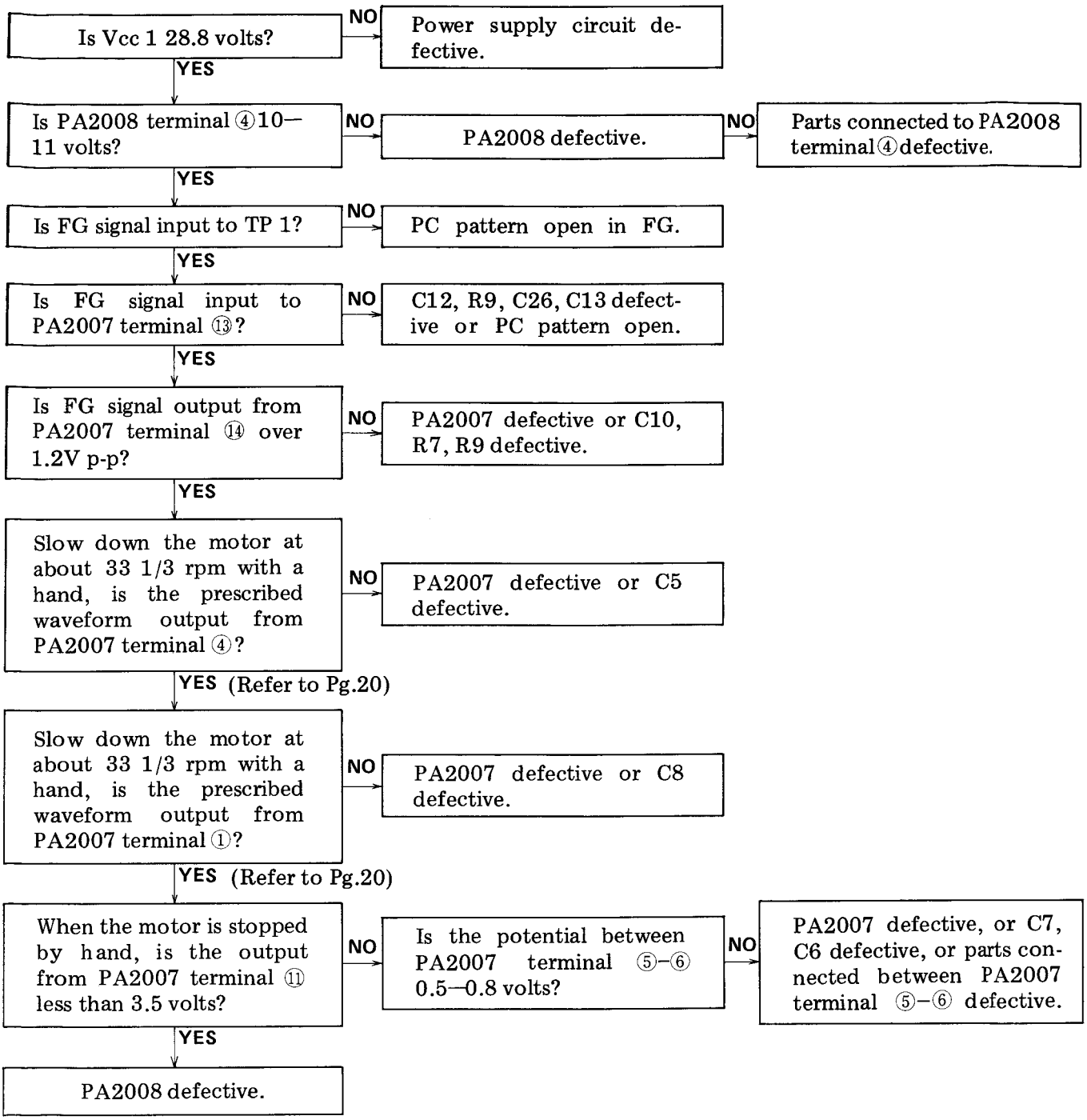
• Unsteady Rotation


Connect PA2007 terminal ① and ⑦ to a oscilloscope and check for phase synchronization.
NO
Adjust VR1 and VR2.
YES
Is prescribed waveform output from PA2007 terminal⑦?
NO
PD1003 defective or X tal OSC defective.
YES (Refer to Pg. 20)
PA2008 defective.

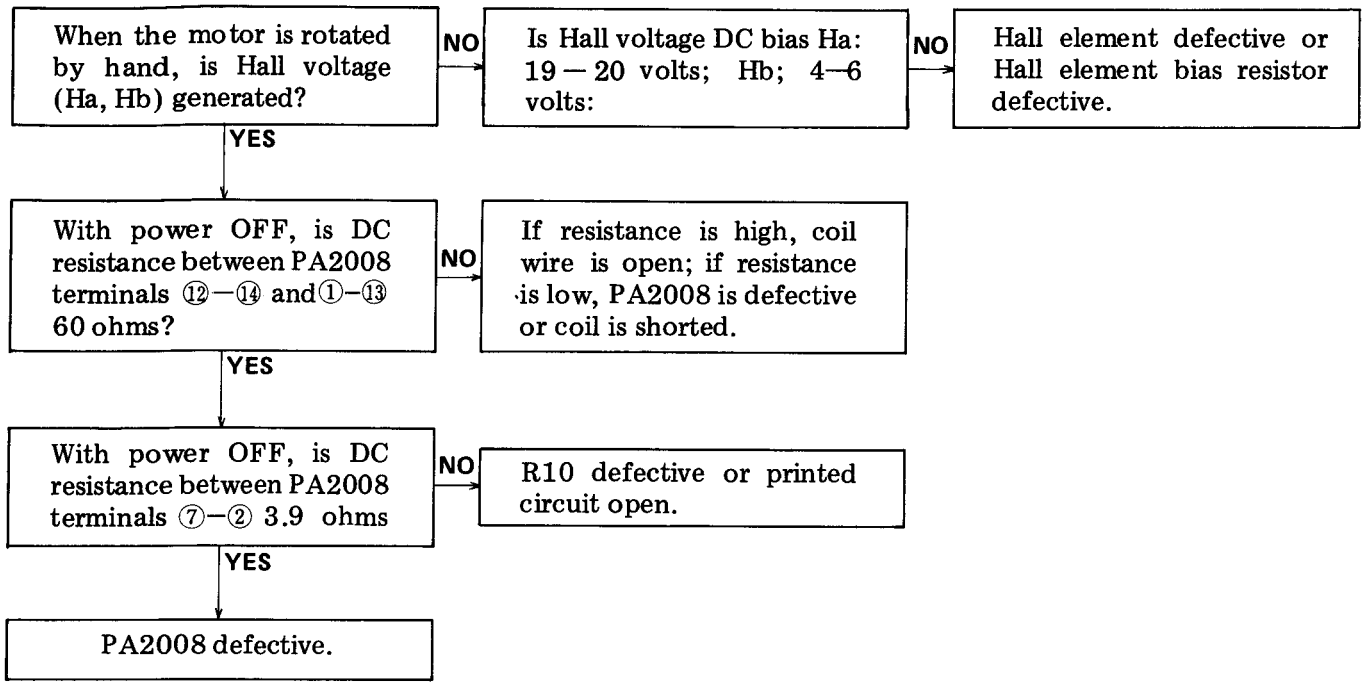
• Lock Indicator Blinking



• **Motor Runs away**


Is Vcc 1 28.8 volts?
NO
Power supply circuit defective.
YES
Is PA2008 terminal ④10—11 volts?
NO
PA2008 defective.
NO
Parts connected to PA2008 terminal ④ defective.
YES
Is FG signal input to TP 1?
NO
PC pattern open in FG.
YES
Is FG signal input to PA2007 terminal ⑬?
NO
C12, R9, C26, C13 defective or PC pattern open.
YES
Is FG signal output from PA2007 terminal ⑭ over 1.2V p-p?
NO
PA2007 defective or C10, R7, R9 defective.
YES
Slow down the motor at about 33 1/3 rpm with a hand, is the prescribed waveform output from PA2007 terminal ④?
NO
PA2007 defective or C5 defective.
YES (Refer to Pg.20)
Slow down the motor at about 33 1/3 rpm with a hand, is the prescribed waveform output from PA2007 terminal ①?
NO
PA2007 defective or C8 defective.
YES (Refer to Pg.20)
When the motor is stopped by hand, is the output from PA2007 terminal ⑪ less than 3.5 volts?
NO
Is the potential between PA2007 terminal ⑤–⑥ 0.5—0.8 volts?
NO
PA2007 defective, or C7, C6 defective, or parts connected between PA2007 terminal ⑤–⑥ defective.
YES
PA2008 defective.

- **Motor Dead Spot**


When the motor is rotated by hand, is Hall voltage (Ha, Hb) generated?
NO
Is Hall voltage DC bias Ha: 19 — 20 volts; Hb; 4—6 volts:
NO
Hall element defective or Hall element bias resistor defective.
YES
With power OFF, is DC resistance between PA2008 terminals ⑫—⑭ and①—⑬ 60 ohms?
NO
If resistance is high, coil wire is open; if resistance is low, PA2008 is defective or coil is shorted.
YES
With power OFF, is DC resistance between PA2008 terminals ⑦—② 3.9 ohms
NO
R10 defective or printed circuit open.
YES
PA2008 defective.

5. PRECAUTIONS FOR REASSEMBLY

Follow these directions and precautions when reassembling a unit after completing repairs. Be sure to lubricate as required, make no mistakes when attaching parts, and avoid all other careless mistakes that may be the cause of trouble later on.

5.1 AREAS THAT REQUIRE LUBRICATION

NOTE:
Types of lubricants and areas where they are used are listed in table 1.

Table 1

Type of Oil	Areas used
Silicon Oil #100000 (GEM-002)	raising shaft
GYA-008	all other areas

Lubrication points are specified for oils other than GYA-008. Never use a different type of oil.

• Cam Section

Apply oil to the heart-shaped grooved section (rear side of the cam) and lock plate sliding section in order to minimize wear on the sliding section and the burden on the mechanism.

• Driving Plate Assembly

Decrease the burden on the mechanism and the wear on the sliding section.

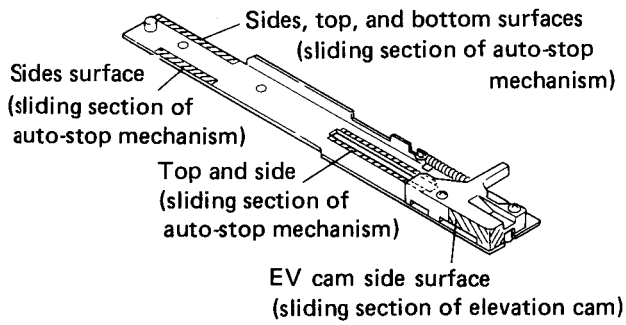

Sides, top, and bottom surfaces
(sliding section of auto-stop mechanism)
Sides surface
(sliding section of auto-stop mechanism)
Top and side
(sliding section of auto-stop mechanism)
EV cam side surface
(sliding section of elevation cam)

Fig. 5-1 Driving panel assembly section switch locker section

• Switch Locker Section

Apply oil to the switch locker (opening) and sub-panel base sliding section to decrease the burden on the mechanism.

When applying oil to the opening (shaft hole), do not apply any oil 2—3mm from the bottom surface. If oil is applied 2—3mm within the bottom surface, it may come out the bottom and go between the switch lever and sub-panel base causing the switch lever to operate ineffectively.

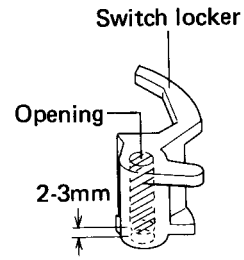


Fig. 5-2 Switch locker section

• Selector Section

Apply oil to the surface of the sub-panel base of the selector sliding section to decrease the burden on the mechanism and wear on the sliding section.

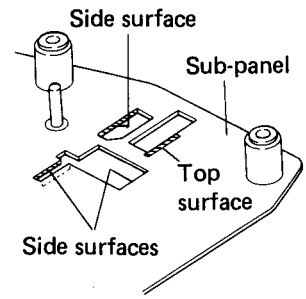


Fig. 5-3 Selector section

• Reset Plate Section

Apply oil to the sub-panel base (shaft) and sliding section of the reset plate to decrease the burden on the mechanism.

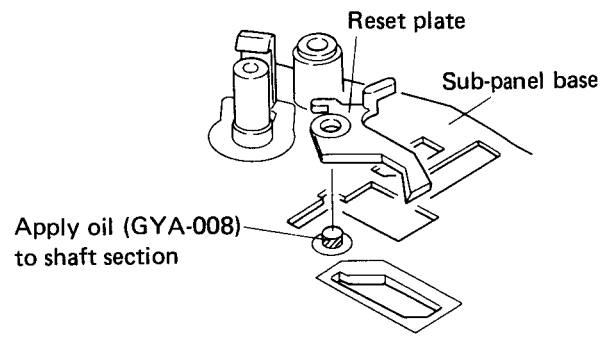


Fig. 5-4 Reset plate section

• Index Cam Section

Apply oil to the index cam, sub-panel shaft section, and lower surface of the hooked section to decrease the burden on the mechanism.

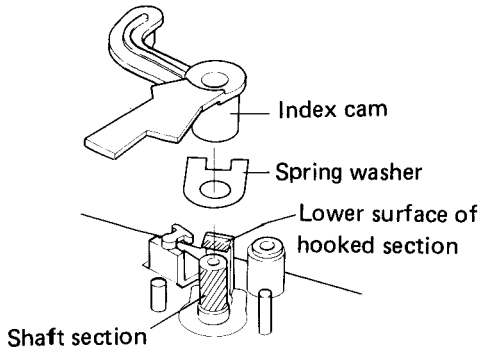


Fig. 5-5 Index cam section

- **EV Lever Unit Section**

Apply oil to the sliding section of leaf spring (A) and EV lever unit to decrease the burden on the mechanism.

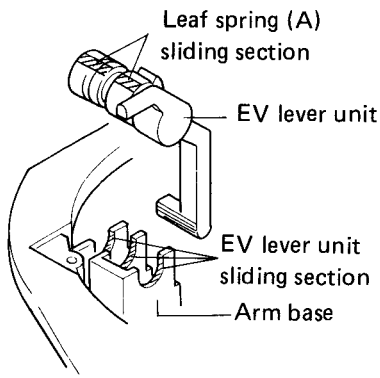


Fig. 5-6 EV lever unit section

- **Elevation Cam Section**

Apply oil to the elevation cam and sliding section of the raising shaft to decrease the burden when operated.

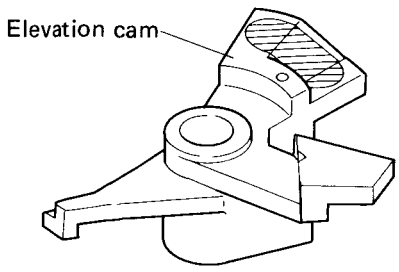


Fig. 5-7 Elevation cam section

- **EV Sheet Section**

Apply oil to the raising shaft and sliding section of the bearing to assure stability in the elevation lowering speed.

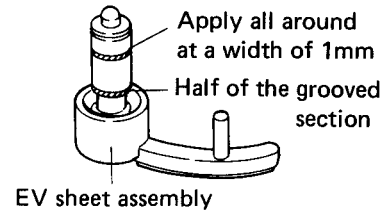


Fig. 5-8 EV sheet section

- **Driving Lever (B) Section**

Apply oil to the driving lever (B), control base, and the sliding section of the driving lever shaft to decrease the burden when operated.

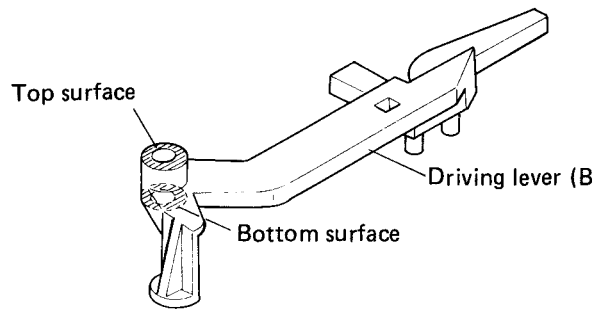


Fig. 5-9 Driving lever (B) section 1

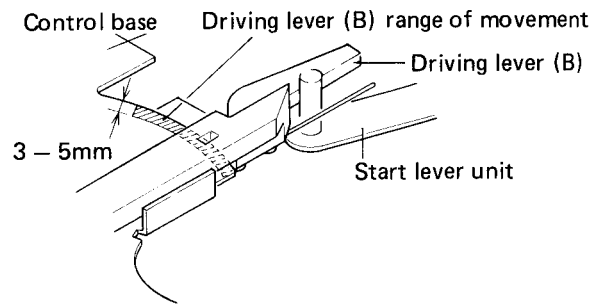


Fig. 5-10 Driving lever (B) section 2

5.2 PRECAUTIONS FOR ATTACHMENT OF PARTS AND REASSEMBLY

- **Reset Plate SP Attachment**

As shown in figure 5-11, the reset plate SP hook is attached by putting the open section on the sub-panel base side.

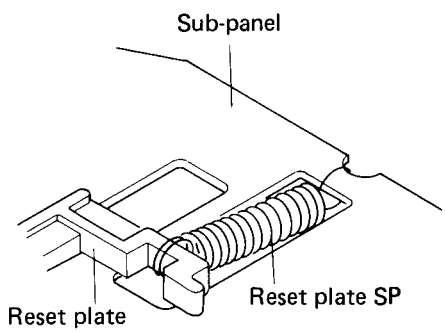


Fig. 5-11 Reset plate SP attachement

- **Cam Assembly Attachment**

The cam assembly is attached by letting the lock plate go in the direction A as shown in figure 5-12.

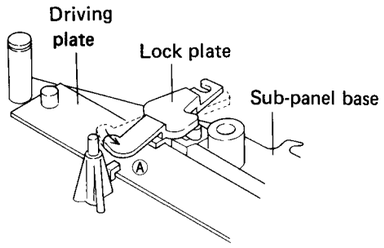


Fig. 5-12 Cam assembly attachment

- **Motor Attachment**

When installing the motor, set the cam in the mechanism stop location and verify that the starting plate section Ⓑ does not protrude beyond surface Ⓐ of the cam. If the motor is attached with the starting plate section Ⓑ protruding, the starting plate may be deformed, the motor pinion gear may be scratched, and the return function may be damaged.

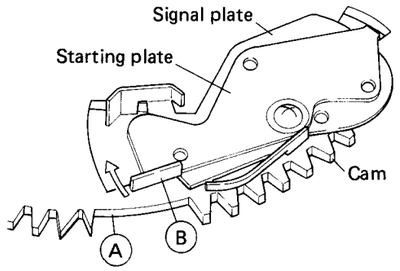


Fig. 5-13 Motor attachment

- **PU Plate Attachment**

Push the PU plate into place so that the PU plate bearing section touches the revolution shaft attachment nut. Installation direction is as shown in figure 5-14.

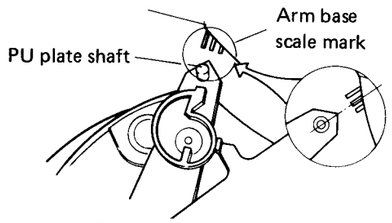


Fig. 5-14 PU plate attachment

- **AS Knob Attachment**

When installing the AS knob, put the AS knob rib against the AS knob revolution control stopper (attached to the arm base) and affix with the screw. As the stopper may break, be sure to press the AS knob down firmly when installing it.

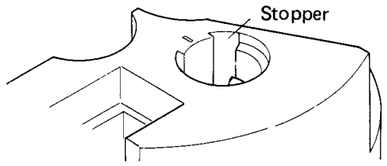


Fig. 5-15 AS knob attachment

- **Arm Base Attachment**

When attaching the arm base section to the mechanism section, put the mechanism section switch locker and switch lever in the locked position and verify that the tonearm is in the arm rest location. Also be sure to put the manual elevation lever in the up position and check that the PU plate shaft is in the position shown in figure 5-16.

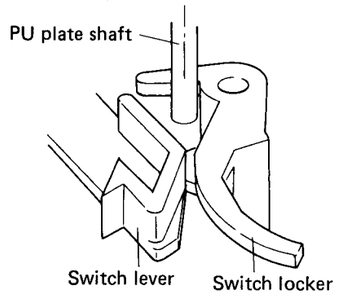


Fig. 5-16 Arm base attachment

- **Start Lever Unit Attachment**

Attach the shaft section of the start lever unit as shown in figure 5-17 so that it comes between the reset plate and start panel.

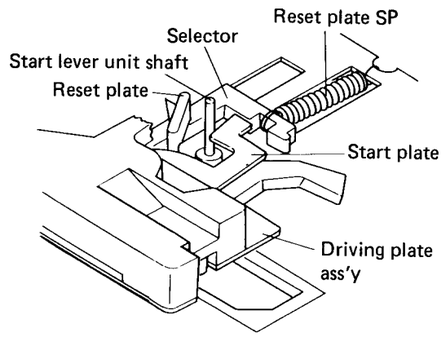


Fig. 5-17 Start lever unit attachment

- **Wiring the Connector**

When attaching the wires to the 2P connector from the microswitch, bend the lead wires from the connector housing as shown in figure 5-18 before attaching.

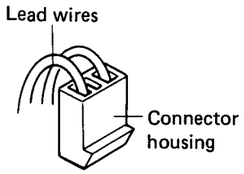


Fig. 5-18 Wiring the connector

6. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561*	*RD¼PS* 5 6 1	*J*
47kΩ	*47 × 10³*	*473*	*RD¼PS* 4 7 3	*J*
0.5Ω	*0R5*		*RN2H* 0 R 5	*K*
1Ω	*010*		*RS1P* 0 1 0	*K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621*	*RN¼SR* 5 6 2 1	*F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

POWER SUPPLY ASSEMBLY (XWR-005)

CAPACITOR

Mark	Part No.	Symbol & Description	
⚠	PCL-036	C1	Capacitor

CAPACITORS AND RESISTORS

Mark	Part No.	Symbol & Description
	CEA 102M 50L	C2
	CEA 470M 35L	C3
	CKDYF 103Z 50	C4
	CEA 330M 6.3L	C6
	RS1PF222J	R1
	RD1/4PM622J	R2
	RD1/4PM562J	R3

CONTROL ASSEMBLY (XWM-056)

SWITCH AND SEMICONDUCTORS

Mark	Part No.	Symbol & Description	
★★	PSG-029	S2	Push switch
★★	2SD985	Q1	
★★	2SC1815 (2SC945)	Q2	
★	PCX-010 (WL02)	D1	
★	WZ-300 (MZ-300)	D2	

LED ASSEMBLY (XWX-061)

Mark	Part No.	Symbol & Description	
★	GL-9PR2	D3	LED

MOTOR ASSEMBLY (PWM-061)

CAPACITORS

Mark	Part No.	Symbol & Description
	CCDCH 330J 50	C1
	CKDYF 103Z 50	C2,C4,C10,C23
	CCDCH 560J 50	C3
	CQMA 123K 50	C5
	CKDYF 104Z 50	C6,C7
	CQMA 473K 50	C8
	CEA R47P 50	C15
	CEA 101P 10	C12
	CSZA R22M 35	C16
	CEANL R22M 50	C14
	CEA 100P 16	C24
	CEA 100P 35	C18 – C22
	CKDYF 203Z 50	C11,C13,C25,C26
	CEA 010P 50	C27, C28

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD 1/4 PM □□□J	R1,R2,R5–R8,R9,R11–R15
	RN 1/4 PR □□□G	R3
	RD 1/2 PS3R9J	R10
★	PCP-052	VR1,VR2 (47k-B)

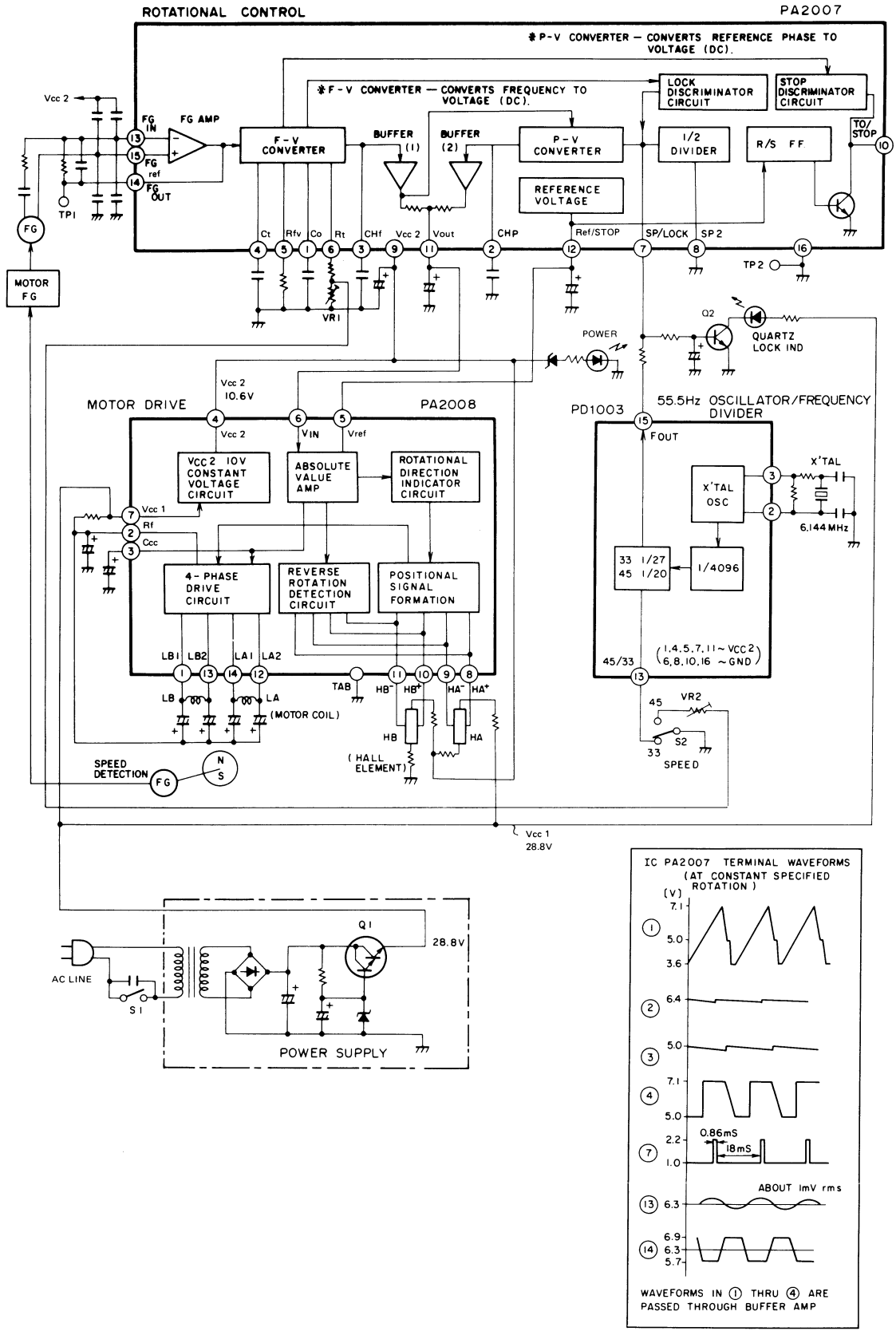
SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PA2007	IC1
★★	PA2008	IC2
★★	PD1003	IC3
★	WZ-050 (RD5.1EB)	D1

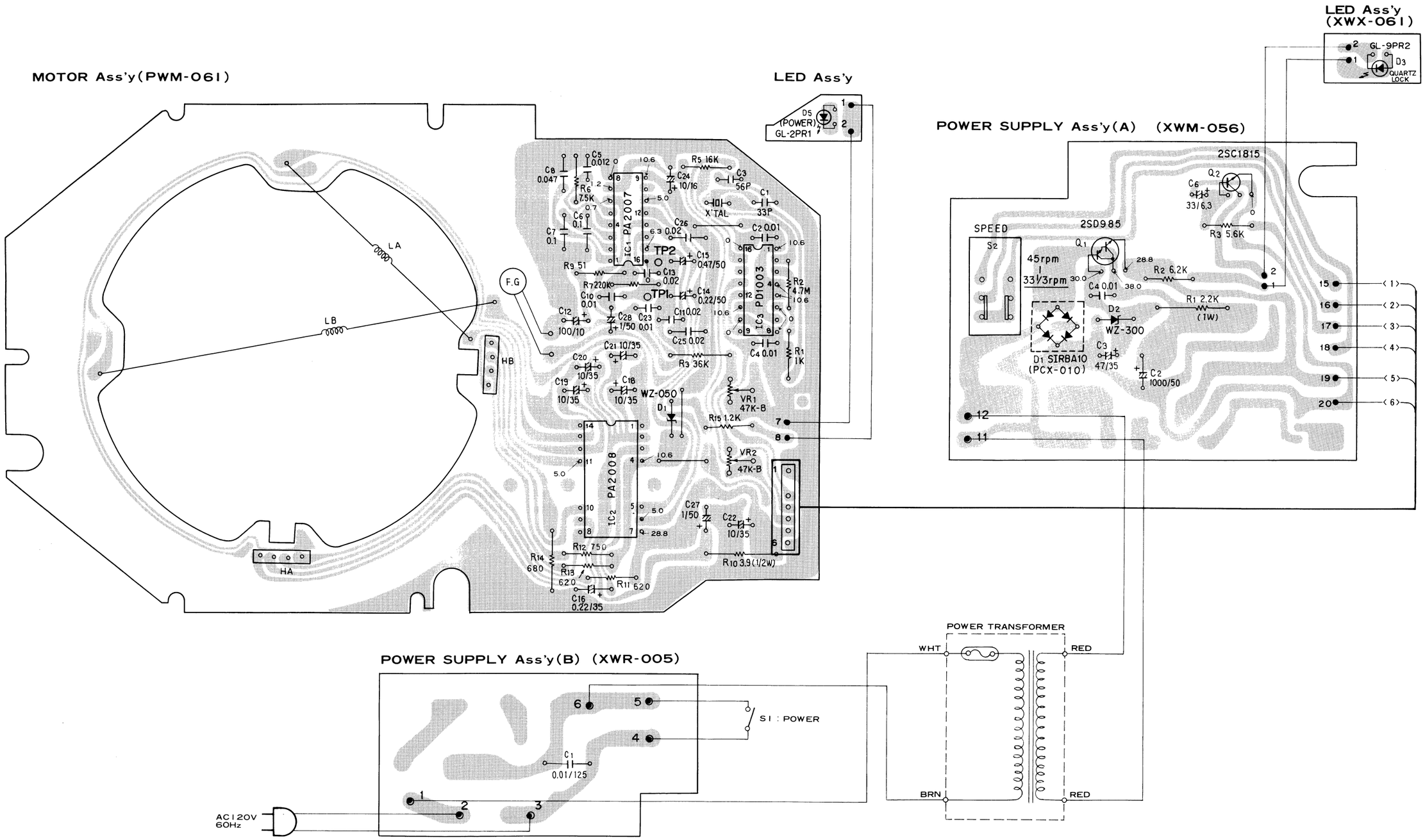
OTHERS

Mark	Part No.	Symbol & Description	
★	PCX-039	HA,HB	Hall element
★	PSS-003		X'tal
	SD-5049-06A		Connector
	SD-5046-02A		Connector

7. BLOCK DIAGRAM



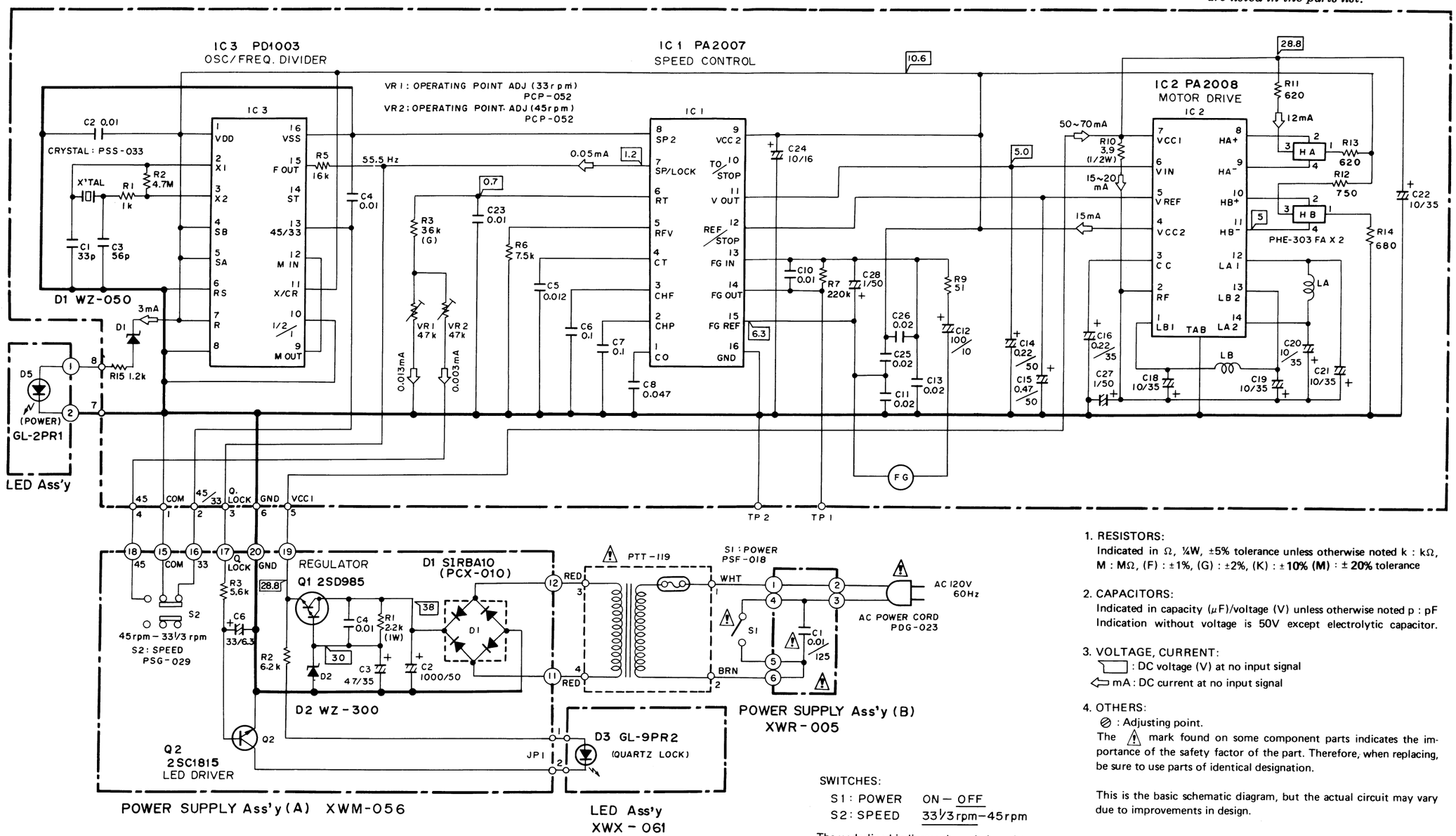
8. P.C.BOARDS CONNECTION DIAGRAM



9. SCHEMATIC DIAGRAM

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

MOTOR Ass'y PWM-061



1. RESISTORS:
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% **(M)** : ± **20%** tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
: DC voltage (V) at no input signal
⇦ mA : DC current at no input signal

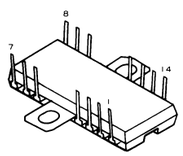
4. OTHERS:
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

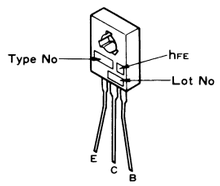
SWITCHES:
S1 : POWER ON – OFF
S2 : SPEED 33⅓rpm–45rpm
The underlined indicates the switch position.

External Appearance of Transistors and ICs

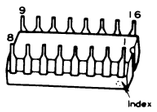
PA2008



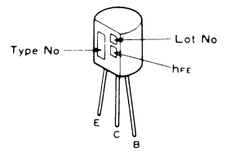
2SD985



PA2007
PD1003

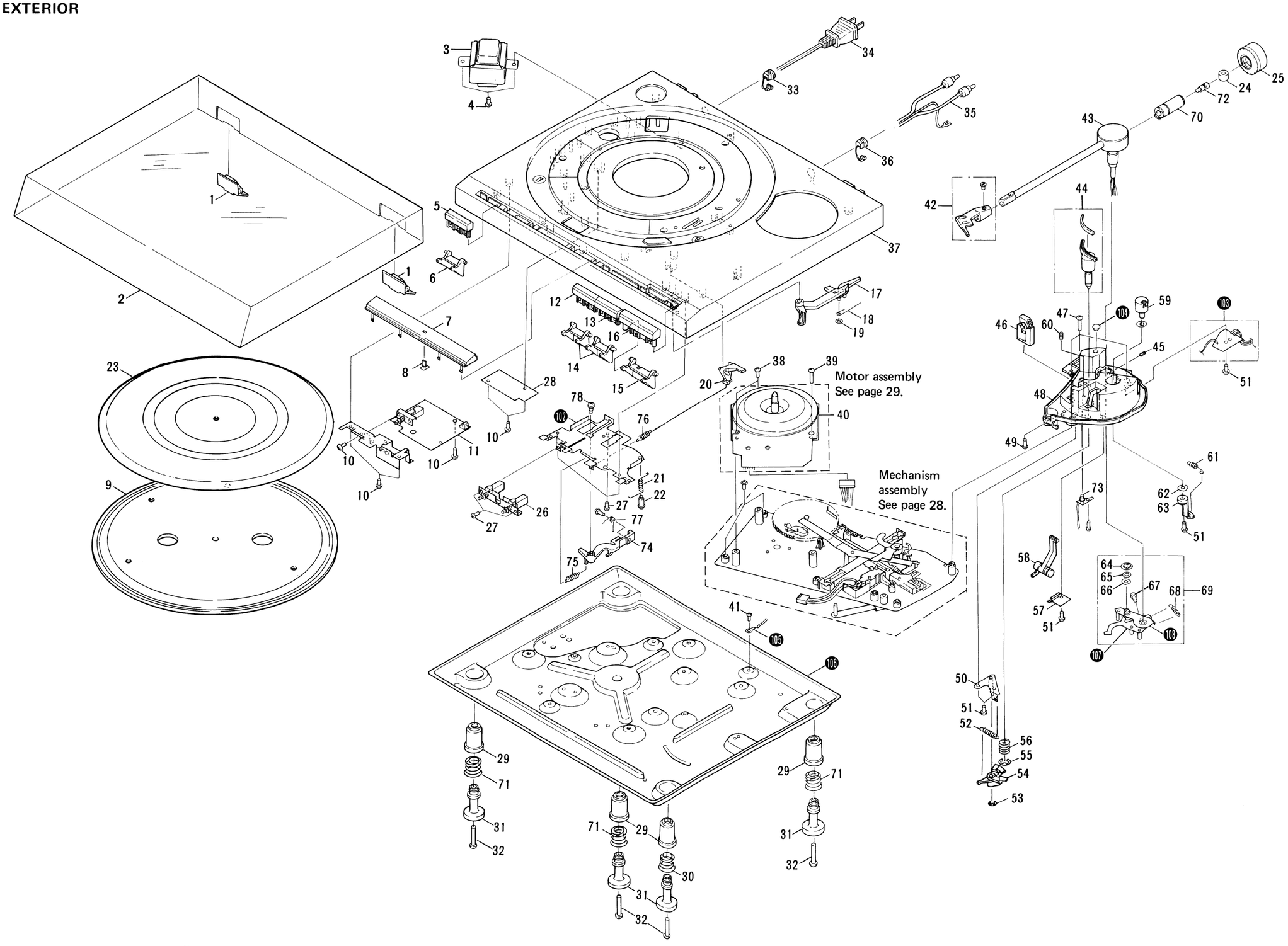


2SC945
2SC1815



10. EXPLODED VIEWS

10.1 EXTERIOR



Parts List of Main Panel

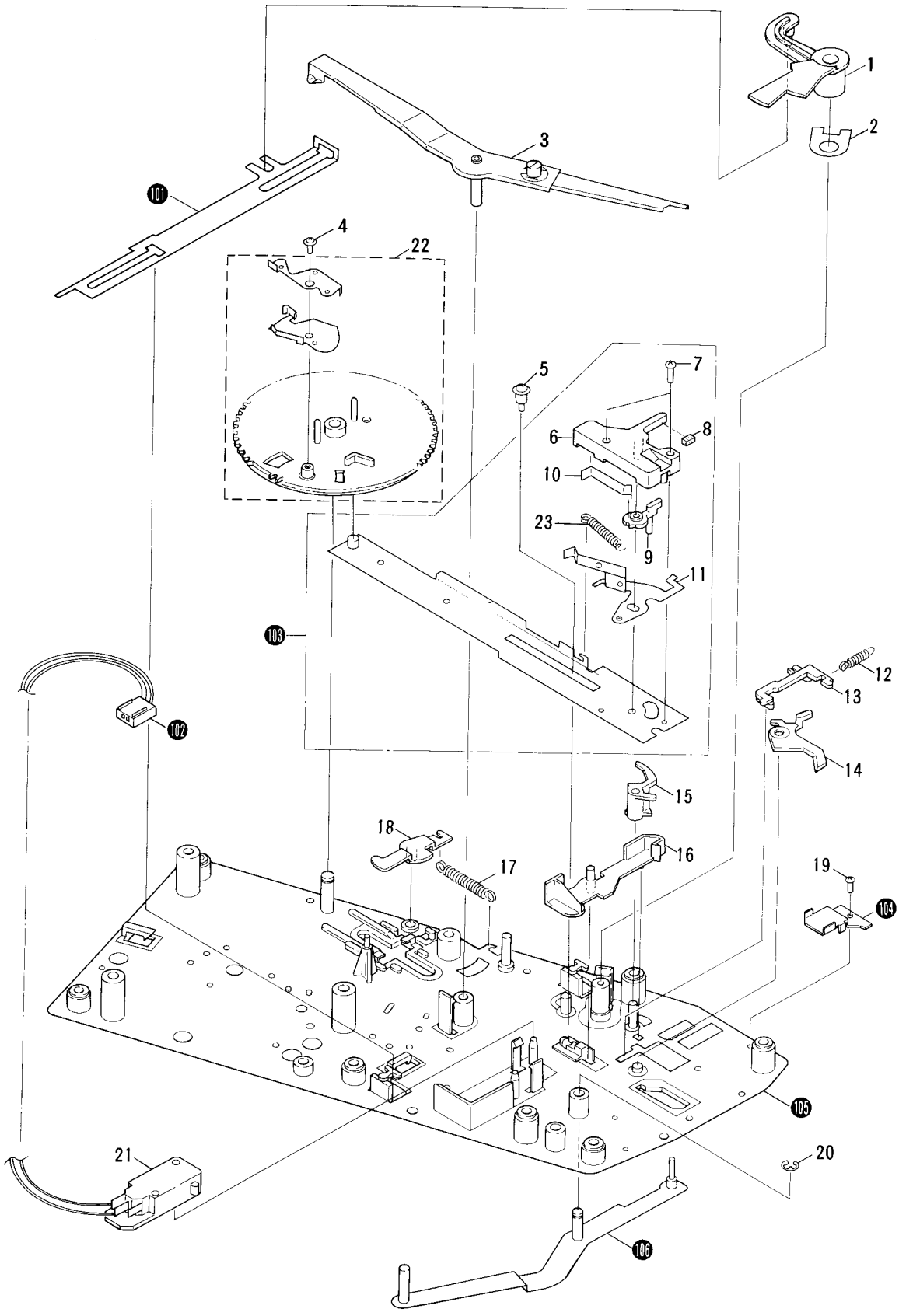
NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description
★	1.	PXB-155	Hinge assembly
★★	2.	PNV-034	Dust cover
⚠ ★	3.	PTT-119	Power transformer (120V)
	4.	PLZ40P120FMC	Screw
	5.	PAD-088	SP knob (A) unit
	6.	PNX-292	Switch lever (B)
	7.	PAM-074	Front name plate (A)
	8.	XWX-061	LED assembly
	9.	PNR-163	Turntable platter
	10.	PPZ30P080FMC	Screw
	11.	XWM-056	Control assembly
	12.	PAD-087	SE knob (A) unit
	13.	PAD-086	R knob (A) unit
	14.	PNX-291	Switch lever (A)
	15.	PNX-303	Switch lever (C)
	16.	PAD-085	S/S knob (A) unit
	17.	PNX-289	Driving lever
	18.	PBH-247	Driving lever (A) spring
	19.	YP30S	Washer
	20.	PNX-290	Control lever
	21.	PBH-307	Switch lever (C) spring
	22.	PBA-086	Screw
	23.	PEA-057	Rubber mat assembly
	24.	PNT-554	Rubber bush
	25.	PXM-501	Weight assembly
	26.	PSG-033	Push switch
	27.	PDZ30P050FMC	Screw
	28.	XWR-005	Power supply assembly
	29.	PEB-194	Damper cushion
	30.	PBH-295	Spring
	31.	PNX-293	Holder
	32.	PBA-118	Screw
	33.	PEC-058	Strain relief
⚠	34.	PDG-023	Power cord
	35.	PDE-064	PU cord
	36.	PEC-056	Strain relief
	37.	PNX-346	Panel
	38.	PBA-124	Screw
	39.	PBA-108	Screw
★★	40.	PXM-091	Motor
	41.	PDZ30P050FMC	Screw
	42.	PXA-882	Headshell assembly
★	43.	PPD-624	Tonearm assembly
	44.	PXB-227	EV sheet assembly
	45.	ZMD40H080FBT	Screw

Mark	No.	Part No.	Description
★	46.	PXB-247	Tonearm rest assembly
	47.	PBA-108	Screw
	48.	PNX-334	Tonearm base
	49.	IPZ30P100FMC	Screw
	50.	PXT-462	EV plate spring (B) unit
	51.	VBZ30P080FMC	Screw
	52.	PBH-238	EV cam spring
	53.	YE30S	E-type washer
	54.	PNX-339	EV cam
	55.	YE50S	E-type washer
	56.	PBH-293	EV spring
	57.	PBK-053	EV plate spring
	58.	PNX-336	EV lever
	59.	PAC-100	AS knob
	60.	ZMR30H150FZK	
	61.	PBH-292	Spring
	62.	PBE-012	AS spring washer
	63.	PNX-335	AS plate
	64.	YS40FBT	Fixed washer
	65.	WC40FMC	Plate washer
	66.	PNC-227	PU spring washer
	67.	PMD40P060FMC	Screw
	68.	PBH-244	PU plate spring
	69.	PXB-228	PU plate assembly
	70.	PXT-596	Weight shaft assembly
	71.	PBH-294	Spring
	72.	PBA-535	Screw
★	73.	GL-2PR1	D5 Diode
	74.	PNX-340	Slider
	75.	PBH-320	Spring
	76.	PBH-321	Spring
	77.	PBH-322	Spring
	78.	PBA-128	Screw
	101.		. . . . .
	102.		Controller base
	103.		PU cord assembly
	104.		Rubber bush
	105.		Lead unit (GND)
	106.		Base
	107.		PU plate (B)
	108.		PU plate (A)

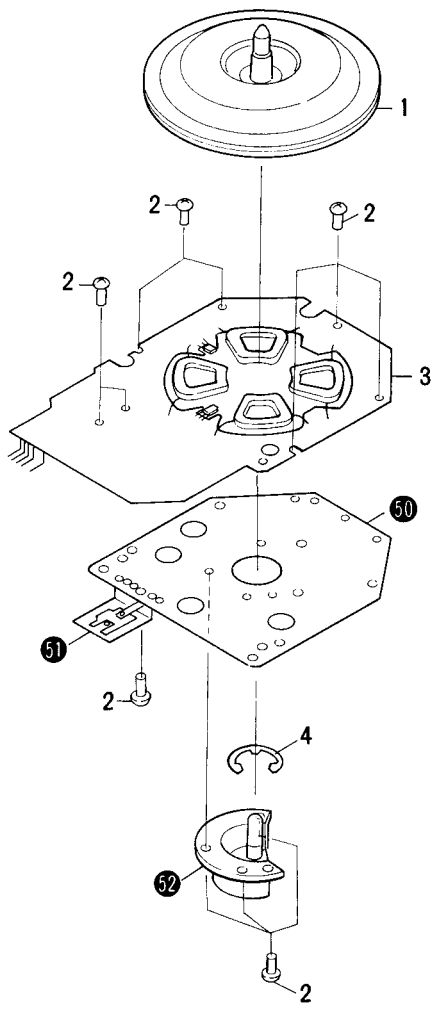
10.2 MECHANISM ASSEMBLY



Parts List

Mark	No.	Part No.	Description
	1.	PNX-305	Index cam
	2.	PBK-039	Spring washer
	3.	PXT-355	Detector lever unit
	4.	PBA-126	Screw
	5.	PBA-123	Screw
	6.	PNX-304	EV cam
	7.	PMZ26P100FMC	Screw
	8.	PEC-065	EV cam buffer
	9.	PNX-032	Lead ratch
	10.	PBK-038	Plate spring
	11.	PXT-454	Start plate unit
	12.	PBH-223	Reset plate spring
	13.	PNX-029	Selector
	14.	PNX-028	Reset plate
	15.	PNX-031	Switch lock angle
	16.	PNX-030	Switch lever
	17.	PBH-225	Lock plate spring
	18.	PNX-035	Lock plate
	19.	PDZ30P050FMC	Screw
	20.	YE30S	E-type washer
⚠ ★★	21.	PSF-018	Microswitch
	22.	PYY-100	Cam assembly
	23.	PBH-224	Start plate spring
	101.		Select lever
	102.		Connector assembly
	103.		Driving plate assembly
	104.		Protection plate
	105.		Sub-panel unit
	106.		Start lever unit

10.3 MOTOR ASSEMBLY



Parts List

Mark	No.	Part No.	Description
	1.	PXT-458	Rotor unit
	2.	PSZ30P050FMC	Screw
	3.	PWM-061	Motor assembly
	4.		E ring (ETW-12)
	50.		Base unit
	51.		Heat sink
	52.		Shaft holder

11. ADJUSTMENTS

11.1 AUTO-RETURN ADJUSTMENT

1. Turn the auto return adjustment screw full around counter clockwise.
2. When the auto return adjustment screw is turned back a little at a time clockwise, the tonearm will commence to return to the outer circumference.
3. Stop turning the adjustment screw once the stylus tip is 33mm away from the center shaft.
4. Once the above adjustment procedure has been completed, check that the tonearm returns automatically as designed.

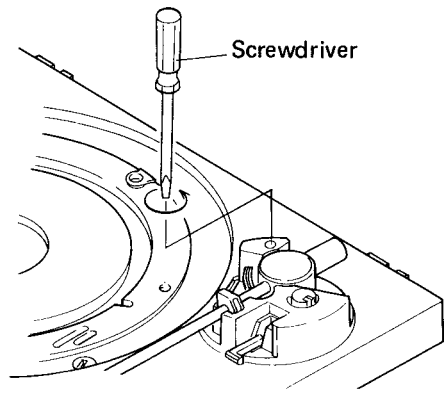


Fig. 11-1 Auto-return adjustment

11.2 ARM-ELEVATION ADJUSTMENT

To proceed with the elevation sheet height adjustment, insert the hexagonal wrench (for 3mm) into the hole at the front of the EV sheet and rotate it clockwise to reduce the height and counter-clockwise to increase the height, The height of the stylus tip from the record surface is 7 ±2mm.

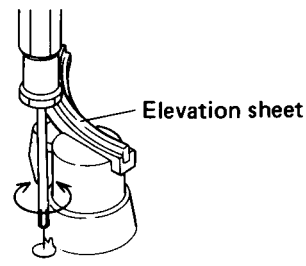


Fig. 11-2 Arm-elevation adjustment

11.3 STYLUS LANDING POSITION ADJUSTMENT

1. Place a 30 cm record on the platter.
2. Depress the START/STOP button and start auto play.
   Check the direction and amount of stylus deviation (how many millimeters toward the inside or outside of the record's lead-in groove).
3. Depress the START/STOP button and return the tonearm to the arm clamp.
4. After the platter has stopped rotating, check the screw in the adjustment hole.
5. Rotate the screw with a small screwdriver in accordance with the direction of the deviation observed in step 2.

- Every semi-turn of the screw corrects the stylus descent position by about 18 mm.
- Rotate the screw clockwise if the stylus descends on the outside of the proper position.
- Rotate the screw counterclockwise if the stylus descends on the inside of the proper position.

6. Depress the START/STOP button and check that the adjustment has been performed properly
   Repeats steps 3 through 6 if the stylus still deviates.

Proceed as follows when the stylus does not descend in the proper position on the record during auto play.
While performing the adjustment, take care not to scratch the record with the stylus.

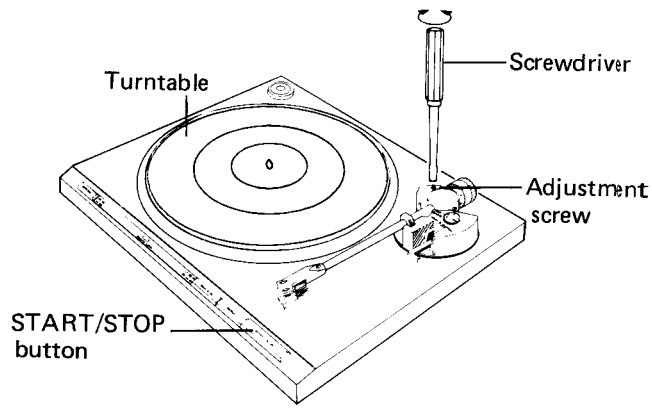


Fig. 11-3 Stylus landing point adjustment

11.4 MOTOR ROTATION ADJUSTMENT

1. Set the speed to 33 1/3 rpm and start up the turntable by depressing the PLAY/STOP button.
2. Connect the self made buffer amp such as (Fig. 11.4) to the #1 terminal of IC PA2007 and output the waveform to a oscilloscope (Fig. 11-4).
3. When a waveform such as the one illustrated in Fig. 11-5 appears on the oscilloscope, vary gain on the oscilloscope until a sawtooth wave a 5 div peak-to-peak is attained. Then referring to Fig. 11-5, adjust the ratio of a/b to 3/2 by adjusting VR1. (The presence of noise may affect this adjustment, so it must be done carefully.)
4. After 33 1/3 rpm adjustment is completed, switch to 45 rpm and adjust VR2 by the same way of step 3. Always adjust 33 1/3 rpm first and always make both adjustments even though only one adjustment may be off.
5. Connect the oscilloscope to the #7 pin of PA2007 and make sure 33 1/3 rpm is at 55.5 Hz and 45 rpm is at 75 Hz.

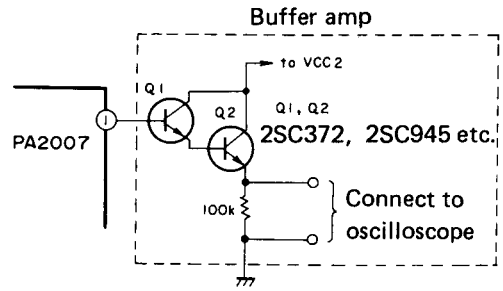


Fig. 11-4 Buffer amp connection

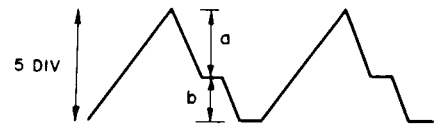


Fig. 11-5 Sawtooth wave adjustment

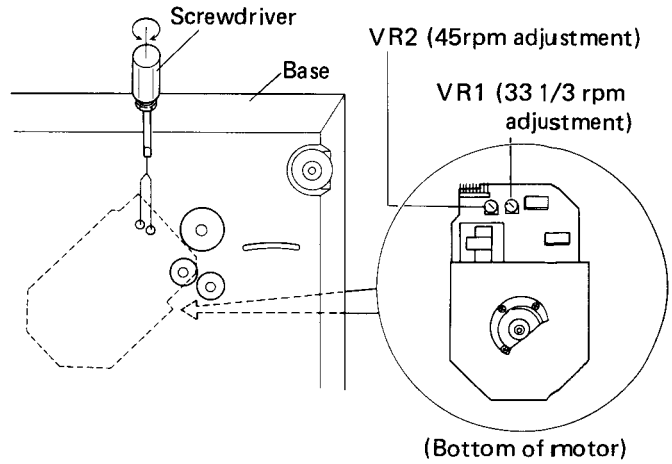


Fig. 11.6 Motor rotating adjustment

11. RÉGLAGE

11.1 RÉGLAGE DU RETOUR AUTOMATIQUE DU BRAS

1. Tourner la vis de réglage du retour automatique du baas à fond dans le sens contraire des aiguilles d'une montre.
2. Lorsque la vis de réglage du retour automatique du bras est tournée d'une petite quantité dans le sens des aiguilles d'une montre, le bras de lecture commence à retourner vers la périphérie du plateau.
3. Arrêter de tourner la vis de réglage lorsque l'extrémité de la pointe de lecture se trouve à 33mm de l'axe central.
4. Lorsque le réglage décrit ci-dessus est terminé, vérifier que le bras de lecture retourne automatiquement de la manière désirée.

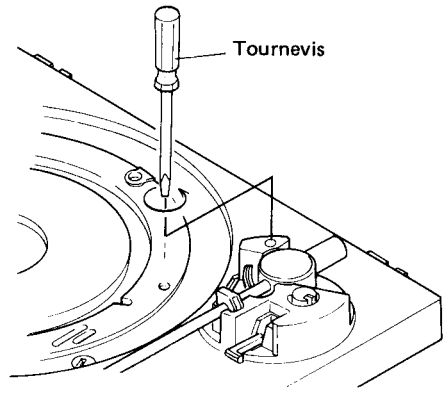


Fig. 11-1 Réglage du retour automatique du bras

11.2 RÉGLAGE DE LA MONTÉE DU BRAS

Pour régler la hauteur de la plaque de montée, introduire une clé hexagonale (de 3mm) dans le trou situé devant la plaque "EV" et la tourner dans le sens des aiguilles d'une montre pour réduire la hauteur, ou dans le sens contraire des aiguilles d'une montre pour augmenter la hauteur. La hauteur de l'extrémité de la pointe de lecture au-dessus de la surface du disque est de 7 ±2mm.

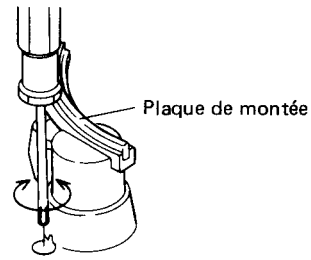


Fig. 11-2 Réglage de la montée du bras

11.3 RÉGLAGE DE LA POSITION DE DESCENTE DE LA POINTE DE LECTURE

1. Placer un disque de 30cm sur le plateau.
2. Appuyer sur la touche START/STOP et débuter la lecture automatique.
   Contrôler la direction et la quantité de déplacement de la pointe de lecture (nombre de millimètres vers l'intérieur ou vers l'extérieur par rapport à l'amorce de sillon du disque).
3. Appuyer sur la touche START/STOP et faire retourner le bras de lecture sur son support.
4. Lorsque le plateau a cessé de tourner, contrôler la vis dans le trou de réglage.
5. Faire tourner la vis à l'aide d'un petit tournevis, en fonction du sens de l'écart observé à l'étape 2.

- Chaque demi-tour de la vis corrige la position de descente de la pointe d'environ 18mm.
- Tourner la vis dans le sens des aiguilles d'une montre si la pointe de lecture descend vers l'extérieur par rapport à la position correcte.
- Tourner la vis dans le sens contraire des aiguilles d'une montre si la pointe de lecture descend vers l'intérieur par rapport à la position correcte.

Si la pointe de lecture ne descend pas sur la position correcte lors de la lecture, procéder comme suit.
Lors du réglage, prendte soin de ne pas rayer le disque avec la pointe de lecture.

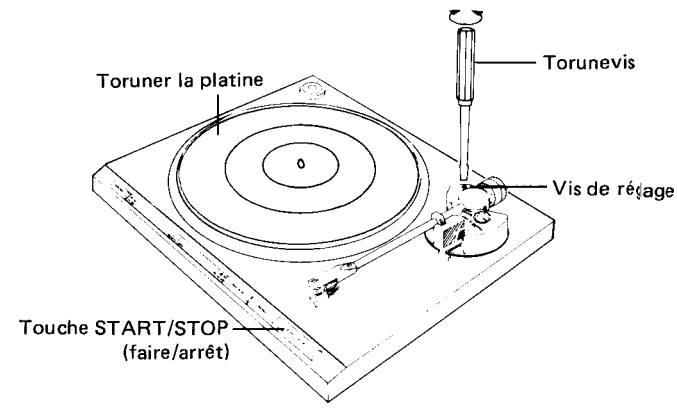


Fig. 11-3 Réglage de la position de descente du bras de lecture

6. Appuyer sur la touche START/STOP et vérifier que le réglage a été réalisé correctement.
   Si la pointe de lecture s'écarte de la position correcte, répéter les étapes 3 à 6.

11.4 REGLAGE DE LA VITESSE DU MOTEUR

1. Régler la vitesse à 33-1/3 tpm et faire tourner la platine en appuyant sur la touche PLAY/STOP (lecture/arrêt).
2. Raccorder l'amplificateur intermédiaire à la borne n° 1 de IC PA2007 (Fig. 11-4) et fournir la sortie de forme d'onde à un oscilloscope.
3. Lorsque la forme d'onde sur le oscilloscope est telle que le représente la figure **11-5**, modifier le gain sur le oscilloscope jusqu'à ce que l'on obtienne une onde en dents de scie de 5 divisions de crête à crête. Puis, en se reportant à la figure **11-5**, régler le rapport a/b à 3/2 en jouant sur VR1. (La présence de bruit risquant d'affecter le réglage, celui-ci doit être effectué avec précautions.)
4. Après avoir terminé le réglage de 33-1/3 tpm, répéter l'opération 3 pour le réglage de 45 tpm au moyen de VR2. Toujours régler 33-1/3 tpm en premier et toujours effectuer les deux réglages même si seul l'un d'entre eux est nécessaire.
5. Raccorder le oscilloscope à la broche n° 7 de PA2007 et s'assurer que 33-1/3 tpm est à 55,5 Hz et que 45 tpm est à 75 Hz.

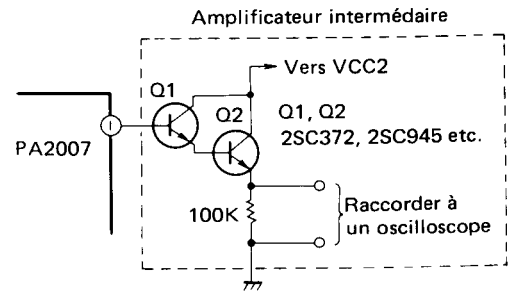


Fig. 11-4 Raccordement de l'amplificateur intermédiaire

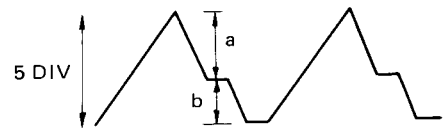


Fig. 11-5 Réglage de l'onde en dents de scie

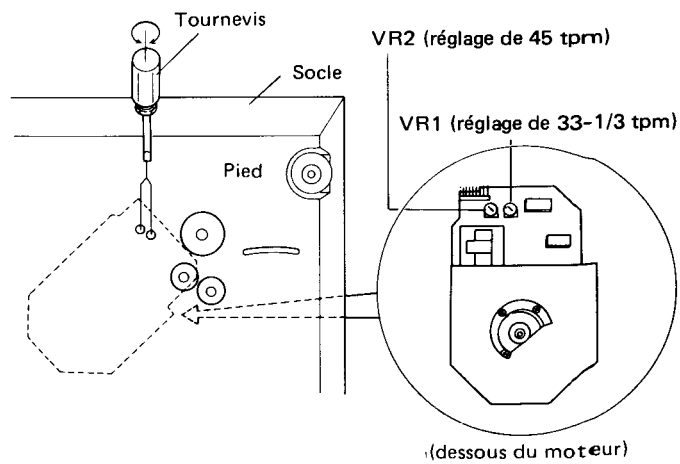


Fig. 11-6 Réglage de la vitesse du moteur

11. AJUSTE

11.1 AJUSTE PARA EL RETORNO AUTOMÁTICO

1. Girar el tornillo de ajuste del retorno automático completamente hacia la izquierda.
2. Cuando el tornillo de ajuste del retorno automático se gira un poco hacia la derecha, el brazo fonocaptor empezará a volver hacia la circunferencia exterior.
3. Dejar de girar el tornillo de ajuste cuando la punta de la aguja esté a 33mm del eje central.
4. Una vez realizado el ajuste arriba mencionado, comprobar que el brazo fonocaptor retorna automáticamente como se ha designado.

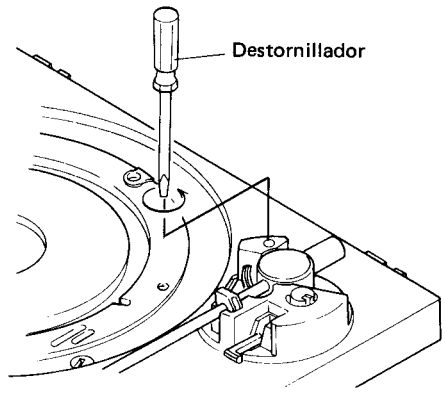


Fig. 11-1 Ajuste del retorno automático

11.2 AJUSTE DE LA ELEVACIÓN DEL BRAZO

Para proceder con el ajuste de la altura del dispositivo de elevación, insertar la llave de apriete hexagonal (de 3mm) en el orificio de la parte frontal del dispositivo de elevación y girarla hacia la derecha para reducir la altura y hacia la izquierda para aumentarla. La altura de la punta de la aguja desde la superficie del disco deberá ser de 7 ±2mm.

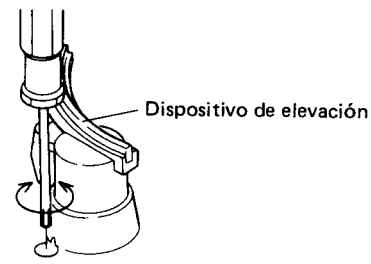


Fig. 11-2 Ajuste de la elevación del brazo

11.3 AJUSTE DE LA POSICIÓN DE DESCENSO DE LA AGUJA

1. Poner un disco de 30cm en el plato.
2. Presionar el botón de inicio/parada (START/STOP) e iniciar la reproducción automática. Comprobar la dirección y cantidad de desviación de la aguja (los milímetros hacia el interior o exterior del surco inicial del disco).
3. Presionar el botón de inicio/parada (START/STOP) y llevar el brazo a su posición de retén.
4. Una vez el plato ha dejado de girar, comprobar el tornillo del orificio de ajuste.
5. Girar el tornillo con un destornillador pequeño de acuerdo con la dirección de la desviación observada en el paso 2.

- Cada media vuelta del tornillo corrige la posición de descenso de la aguja en unos 18mm.
- Girar el tornillo hacia la derecha si la aguja desciende en el exterior de la posición correcta.
- Girar el tornillo hacia la izquierda si la aguja desciende en el interior de la posición correcta.

6. Presionar el botón de inicio/parada (START/STOP) y comprobar que el ajuste se ha realizado correctamente.
   Repetir los pasos 3 al 6 si la aguja todavia se desvía.

Proceder como se indica a continuación cuando la aguja no desciende en la posición correcta sobre el disco durante la reproducción automática.
Mientras se realiza el ajuste, tener cuidado de no rayar el disco con la aguja.

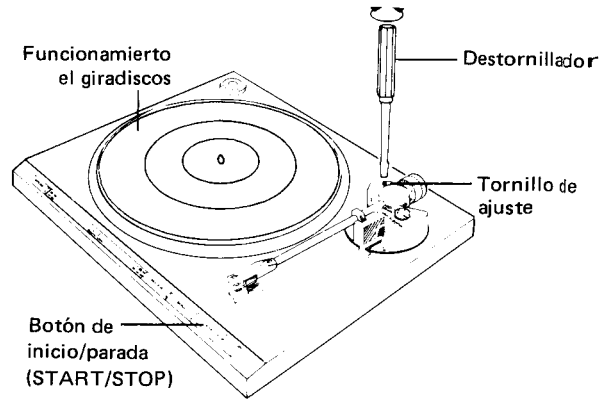


Fig. 11-3 Ajuste del punto de descenso de la aguja

11.4 AJUSTE DE LA ROTACIÓN DEL MOTOR

1. Ajustar la velocidad a 33-1/3 rpm y poner en funcionamiento el giradiscos presionando el botón de reproducción/parada (PLAY/STOP).
2. Conectar el amplificador intermedio, de fabricación propia, como el de la figura 11-4, al terminal no. 1 del IC PA2007 y dar salida a la forma de onda a un osciloscopio (Fig. 11-4).
3. Cuando aparece una forma de onda como la de la ilustración de la Fig. 11-5 en el osciloscopio, variar de nuevo el osciloscopio hasta que se consiga una onda de diente de sierra de 5 div. de cresta a cresta. Luego, refiriéndose a la Fig. 11-5, ajustar la relación de a/b a 3/2 ajustando VR1. (La presencia de ruido puede afectar este ajuste, por lo que se tiene que realizar con cuidado.)
4. Una vez se ha completado el ajuste de 33-1/3 rpm, cambiar a 45 rpm y ajustar TR2 del mismo modo que en el paso. Ajustar siempre 33-1/3 rpm en primer lugar y hacer siempre ambos ajustes aunque sólo se requiera un solo ajuste.
5. Conectar el osciloscopio a la patilla no. 7 del PA2007 y cerciorarse de que 33-1/3 rpm esté a 55, 5 Hz y 45 rpm a 75 Hz.

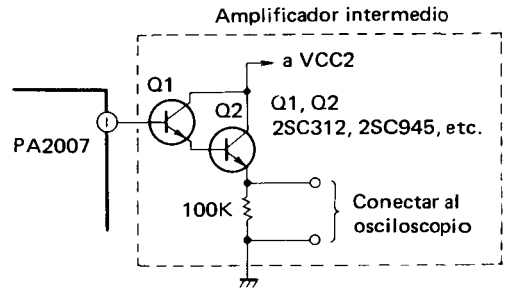


Fig. 11-4 Conexión del amplificador intermedio

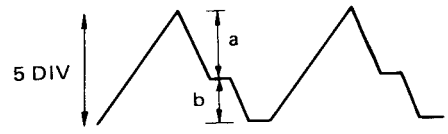


Fig. 11-5 Ajuste de la onda de diente de sierra

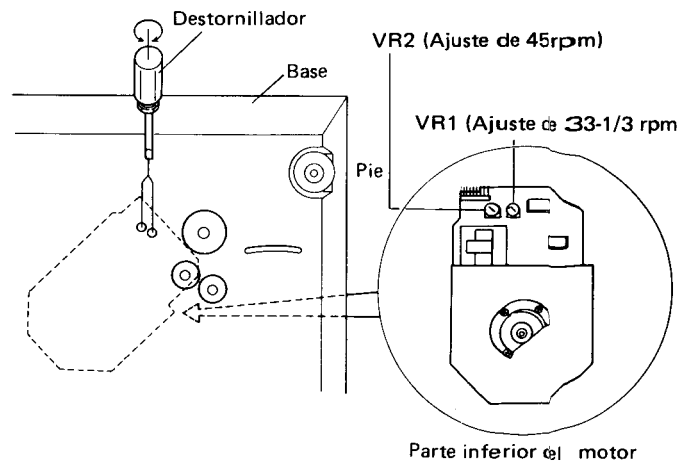
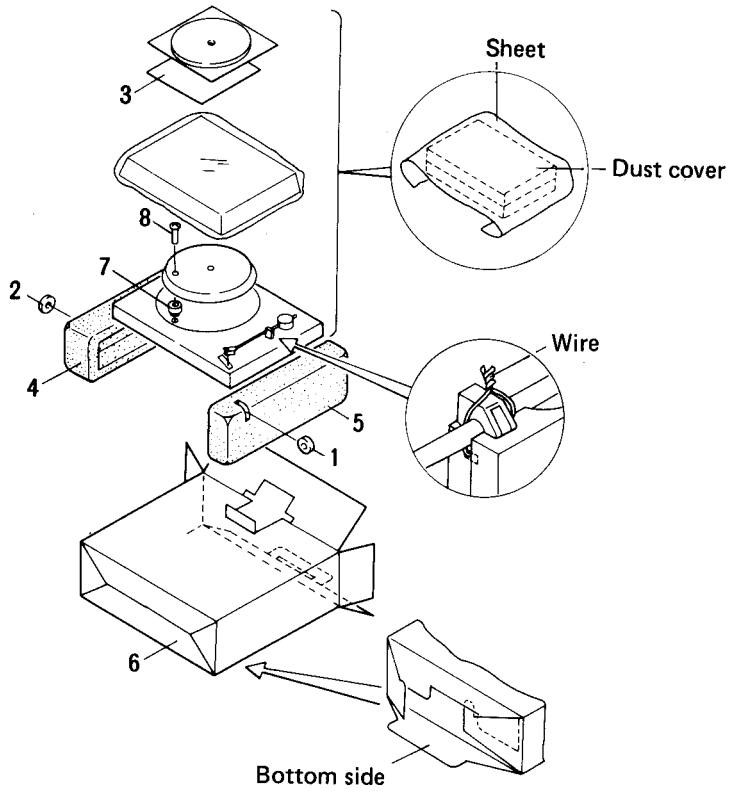


Fig. 11-6 Ajuste de la rotación del motor

12. PACKING



Mark	No.	Part No.	Description
	1.	N93-603	45 adaptor
★	2.	PXB-501	Weight assembly
	3.	PRB-188	Operating instructions
	4.	PHA-127	Protector (L)
	5	PHA-128	Protector (R)
	6.	PHG-438	Packing case
	7.	PNX-294	Turntable platter packing
	8.	PBA-100	Screw
	9.		
	10.		